federal register

Wednesday
April 30, 1980

Part IV

Environmental Protection Agency

Evaporative Emission Regulation and Test Procedure for Gasoline-Fueled Heavy-Duty Vehicles; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 86

[FRL 1442-2]

Evaporative Emission Regulation and Test Procedure for Gasoline-Fueled Heavy-Duty Vehicles

AGENCY: Environmental Protection Agency.

ACTION: Notice of proposed rulemaking.

SUMMARY: This proposed regulation establishes an emission standard, implementation date, certification procedure and test procedure for the control of evaporative emissions of hydrocarbons from gasoline-fueled heavy-duty vehicles (i.e., vehicles having a Gross Vehicle Weight Rating (GVWR) greater than 8,500 pounds). The emission standard proposed here is 3.0 grams/test (g/t) to be effective for 1983 and later model years.

DATES: *Public Hearing:* There will be a public hearing on the provisions of the proposed regulations at least 30 days after publication in the **Federal Register.** EPA will announce the time and place of the public hearing later. Pursuant to Section 307 of the Clean Air Act, the record of the public hearing will be kept open for 30 days following the close of the hearing to provide an opportunity for submission of rebuttal and other information.

PUBLIC COMMENT: During final rulemaking EPA will consider comments received on or before July 7, 1980. We request that, to the extent possible, comments be submitted prior to the hearing. It is EPA's intention to assure all interested parties an opportunity to study all information which may become the basis for EPA's final action in this proceeding. Accordingly, the Agency will not consider in this rulemaking any material which cannot be made available to the public. Parties who wish to submit information in response to this Notice of Proposed Rulemaking are cautioned that EPA will not consider, but will return to the commentor, any comments which are claimed, in whole or in part, to be confidential.

ADDRESSES: Interested persons may submit written comments on this rulemaking (in duplicate if possible) to: Central Docket Section (A-130), Environmental Protection Agency, Attn.: Docket No. OMSAPC-79-1, 401 M Street, SW., Washington, D.C. 20460.

Docket No. OMSAPC-79-1, containing material relevent to this rulemaking, is located in the U.S. Environmental Protection Agency, Central Docket Section, Room 2903B, 401 M Street, SW., Washington, D.C. The docket may be inspected between 8 a.m. and 4 p.m. on weekdays, and a reasonable fee may be charged for copying.

FOR FURTHER INFORMATION CONTACT: Timothy D. Mott, Emission Control Technology Division, Mobile Source Air Pollution Control, Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105, Phone: (313) 668-4462.

SUPPLEMENTARY INFORMATION: In spite of significant gains made in the control of non-methane hydrocarbon (NMHC) emissions, there are many Air Quality Control Regions (AQCRs) which currently do not meet the National Ambient Air Quality Standard (NAAQS) for ozone. (Ozone is created during photo-chemical reactions involving NMHCs and is, therefore, controlled by controlling NMHCs.) Air quality analyses show that attainment of the NAAQS for ozone will be difficult in many of these AQCRs, even if current and planned regulations for NMHC control are implemented.

The Clean Air Act as amended in August 1977 requires that the NAAQS for ozone be met in all regions of the nation by 1982. It is apparent that this goal will probably not be achieved by a number of urban areas of the country. Therefore the Act permits States, if a showing can be made that the standard cannot be achieved by 1982, to include in their implementation plans provisions which will provide for attainment of the NAAQS as expeditiously as practicable, but not later than 1987. A substantial reduction in NMHC emissions, in addition to currently planned control strategies, will be necessary to meet this goal in many regions. For this reason, EPA expects that all reasonable and cost-effective NMHC emission control strategies will be implemented.

EPA analysis (see "Evaluating the Air Quality Impact of Alternative Evaporative Emissions Control Strategies for Heavy-Duty Gasoline Vehicles," EPA, OAQPS, W. Freas, April 1979, in the docket of this rulemaking) estimates that total mobile source NMHC emissions will be 1.1 to 1.3 million tons for 1995. EPA estimates that implementation of this regulation will reduce that by 3.5 to 3.6%. If minimum deterioration is assumed (primarily through Inspection/Maintenance programs) then this regulation could reduce total mobile source NMHC by as much as 12 percent in 1995. Also, EPA estimates that the number of daily violations of the ozone standard from 1980-1995 would be reduced by 2.4-14.0 percent for the 33 worst case AQCRs.

While the above reductions are not large compared to reductions obtained from some other mobile source regulations, the cost of this regulation is expected to be quite small ($34.20 per vehicle). EPA estimates the cost effectiveness of the 3.0 g/test standard at $168 per ton of NMHC controlled. Further, in the case of vehicles equipped with closed-loop fuel metering, the cost effectiveness would be reduced to $-33 per ton NMHC due to an *increase* in vehicle fuel economy. EPA expected virtually all gasoline-fueled heavy-duty vehicles (HDGs) to be equipped with closed-loop fuel metering systems when the mandatory heavy-duty vehicle (HDV) NOx standards are implemented in 1985. Thus, 1985 and later model year HDG owners will enjoy a lifetime fuel savings *greater* than the initial price increase, which is estimated to be $34.20 per vehicle, as a result of this proposed regulation. For HDGs without closed-loop fuel metering the cost effectiveness ($168) is still significantly less than most other recently promulgated NMHC mobile source control strategies.

Pursuant to the requirements of Executive Order 12044, EPA is not required to prepare a "Regulatory Analysis" of this proposed regulation. We have, however, voluntarily prepared a "Regulatory Analysis" in order to thoroughly assess the environmental and economic impacts of the proposed action. This analysis, which has been placed in Docket No. OMSAPC-79-1 also fulfills the requirements of section 317 of the Clean Air Act. The Agency will evaluate additional economic data submitted in response to this proposal, and will revise this analysis as appropriate. We will continue to consider the economic effect of the proposed regulation during all further stages of this rulemaking action.

Proposed Standard: The proposed evaporative emission standard for gasoline-fueled heavy-duty vehicles beginning with the 1983 model year is 3.0 g/t, as tested by the proposed EPA evaporative emission test procedure for gasoline-fueled heavy-duty vehicles (Subpart M of this NPRM). Section 202(a)(1), as amended, 42 U.S.C. 7521(a)(1), provides that the Administrator shall prescribe standards for motor vehicle emissions if such emissions cause or contribute to air pollution which endangers the public health or welfare. The Administrator can require testing of new motor vehicles to determine compliance with applicable standards under section 206, 42 U.S.C. 7525. Section 202(b)(1)(C), 42

U.S.C. 7521(b)(1)(C), requires the Administrator to promulgate a test procedure for measuring "evaporative emissions of hydrocarbons" from heavy-duty vehicles. The general power to promulgate regulations is granted in section 301(a), 42 U.S.C. 7601(a).

Major Regulatory Issues

A Technically Feasible Level of Control

Except as otherwise specified in the Act, emission standards established under section 202(a)(1) must take into account the technical feasibility of compliance. The technically feasible level of control is highly dependent, of course, on the testing procedure. The test procedure which EPA is proposing is basically the procedure which is currently being used for evaporative emission certification of light-duty vehicles and light-duty trucks (trucks with a Gross Vehicle Weight Rating of 8,500 pounds or less). This procedure is known as the enclosure or SHED (Sealed Housing for Evaporative Determination) method.

Most manufacturers of HDGs also manufacture light-duty vehicles (LDVs) and/or light-duty trucks (LDTs), and consequently have participated in the recent rulemakings on the SHED-based 6.0 and 2.0 g/t standards. The general public has also had the opportunity to comment on the SHED test method during these rulemakings. In addition, in March of 1978, EPA distributed a "Draft Recommended Practice for Determination of Evaporative Emissions from Gasoline-Fueled Heavy-Duty Vehicles" to potentially interested parties. Several manufacturers of HDGs responded with comments, and EPA has considered these comments in the development of the test procedure being proposed here.

When determining a feasible standard using the SHED procedure, it is appropriate to consider the parameters which affect the generation of evaporative emissions and, on the basis of these parameters, compare HDG to LDV and LDT. To make this kind of comparison, it is helpful to identify the sources of evaporative emissions. For both light-duty and heavy-duty vehicles, the sources of measured evaporative emissions can be grouped into two main types. These are gasoline emissions from the fuel system and NMHC emissions from non-fuel sources. Each of these emission types contribute to air pollution and to the evaporative emission level measured during both the diurnal and hot soak portions of the test procedure.

Evaporative Emissions From the Fuel System

Fuel system evaporative emissions consist mainly of evaporation from the fuel tank and the carburetor fuel bowl. The fuel tank evaporative emissions result primarily from daily cyclic temperature variations experienced by the vehicle. Consequently, these are described as the diurnal evaporative losses, and are determined by the "diurnal" test sequence. The carburetor fuel bowl evaporative emissions occur when engine heat causes the fuel in the carburetor bowl to evaporate. This is most pronounced shortly after the engine is stopped, since any such losses occurring when the vehicle is operating are burned as part of the fuel-air charge. These evaporative emissions are measured by the portion of the test sequence designated as the "hot soak."

Fuel system emissions during the diurnal part of the test are the result of gasoline vapor generation in the vehicle's fuel tank(s); and the quantity of this generated vapor is approximately proportional to the total fuel tank capacity. The larger the fuel tank capacity, and the greater the diurnal temperature excursion, the more vapor is generated. Fuel system emissions during the hot soak test are mainly the result of gasoline vapor generation in the engine's carburetor; and the quantity of hot soak vapor is approximately proportional to the volume of fuel in the carburetor (for the same gasoline temperature). The larger the volume of fuel in the carburetor and the higher the peak temperature of this fuel, the more vapor is generated. The level to which a system can control evaporative emissions depends on the quantity of generated vapor and on the design of the control system.

The majority of HDGs sold have fuel tank volumes which are within the range covered by LDTs (up to 151 liters, i.e., 40 gallons). This is especially true for HDGs at the lower end of the GVWR range, and for HDGs equipped with standard fuel tanks. Consequently, for such vehicles (i.e., HDGs which have a fuel tank volume within the range covered by LDTs) the quantity of vapor generated in the fuel tank is within the range of LDTs, and the technical feasibility of controlling the emission of this vapor is essentially the same as for LDTs. A substantial amount of evaporative emission data on LDTs has been generated in EPA's 1979 model year vehicle emission certification program. In this program (as of October 20, 1978), EPA conducted 137 valid evaporative emission tests on LDTs. Of these tests, the average result was 2.80 grams/test; and 54 of the tests (39%) were 2.0 g/test or less. Of the 137 tests, 15 were on trucks having fuel tank capacities ranging from 114 liters (30 gallons) to 151 liters (40 gallons). The average result of these 15 tests was 2.2. grams/test, and 47% of these tests were 2.0 g/test or less. These data demonstrate the technical feasibility of controlling fuel system evaporative emissions from vehicles with fuel tank capacities up to 151 liters (40 gallons) to a level of 2.0 g/test.

In addition to the 1979 results, preliminary data from the 1980 model year vehicle emission certification program included 22 valid evaporative emission tests for LDTs (as of June 20, 1979). Of these tests, the average result was 2.13 grams/test; 12 of the tests (55%) were 2.0 g/test or less. Of particular interest were two trucks with fuel tank capacities of 151 liters (40 gallons). The average result for these two was 1.47 g/test. These data reinforce our opinion that technology is available to comply with a 3.0 g/test standard.

Although the majority of HDGs have fuel tank(s) not exceeding 151 liters (40 gallons), there is a substantial percentage of vehicles with larger tanks. EPA has analyzed the 1979 model year LDT certification data for any effect of fuel tank capacity on total evaporative emissions. Although there was not a strong correlation between tank volume and emission level, this analysis (a least squares linear regression) predicts that a 37.9-liter (10 gallon) increase in fuel capacity results in an increase in total evaporative emissions of .05 g/t. This predicts that a 379 liter (100 gallon) fuel system would have 0.3 gram higher evaporative emissions than a 151-liter (40-gallon) system.

The technical feasibility of controlling fuel tank gasoline vapor emission has also been shown in a vehicle refueling emissions test program conducted by the American Petroleum Institute (API). In that program, vehicles were equipped with control systems for the purpose of reducing the amount of gasoline vapor which is emitted to the atmosphere during vehicle refueling. The total quantity of non-controlled HC refueling vapors being emitted from the fuel tank of one vehicle was 88 grams, and a vapor control system was successful in preventing all but 0.4 gram from escaping into the atmosphere. In order to relate 88 grams of vapors to the amount which is generated in evaporative emission testing, tests by both industry and EPA have shown that a 379-liter (100-gallon) fuel system generates about 50 grams of vapor during the diurnal part of the test.

Consequently, the API project has demonstrated the ability to control the amount of diurnal evaporative emissions generated in at least 397-liter (100-gallon) fuel tanks to a level of 0.4 grams.

In addition to fuel tank volume, the other parameters which directly affect the quantity of generated gasoline vapors are the volume of gasoline in the carburetor fuel bowl and the peak temperature of this fuel during the hot soak part of the test. The 1979 model year heavy-duty engines use carburetors which have fuel bowl volumes ranging from about 70 to 268 cc. of gasoline. Carburetors on LDTs have gasoline volumes which typically range from about 70 cc to 150cc; although, one 1979 LDT family does have a carburetor fuel bowl volume of 268 cc. The 1980 LDTs tested have volumes of 69 to 135 cc. With regard to temperature, data submitted to EPA by Ford Motor Company indicate that higher engine output, as required in the HDG driving schedule as compared to the LDT driving schedule, does not result in high carburetor gasoline temperatures during the hot-soak test. Therefore, HDGs do not generate more hot-soak carburetor vapors than do LDTs equipped with the same size carburetors.

Three LDTs with the 268-cc gasoline volume carburetor were evaporative emission tested by EPA in the 1979 certification program (6.0 g/test standard). The total evaporative emission levels from these three tests were 2.2, 2.7, and 4.5 grams. These data demonstrate the feasibility of controlling total evaporative emissions from vehicles with carburetor gasoline volumes representative of the largest HDGs carburetors to the 3.0 gram level.

Evaporative Emissions From Sources Other Than the Fuel System

Some specific sources of non-fuel emissions are vehicle paint, sealers, and sound deadeners. The level of stabilized non-fuel emissions from vehicles is largely dependent on the amount and composition of these materials. Therefore, assuming consistent composition, the amount of non-fuel losses is approximately proportional to the physical size of the vehicles.

EPA has conducted tests (see the docket for this rulemaking) to determine the amount of non-fuel evaporative emissions from one new large gasoline-fueled heavy-duty vehicle (a 1977 Ford Model 800 having a GVWR of 50,000 pounds). These tests were first started on the vehicle when it was 4 days old and testing continued until the vehicle reached an age of about 70 days. Ford commented (see the Appendix to the Regulatory Analysis in the docket) that background emissions might be as high as 1 or 2 g/test based on this same test data. However, Ford's analysis included only the first 30 days' data. It is true that at 30 days total, non-fuel emissions were 1.16 g/t but these emissions continued to drop and at the end of the test period (i.e., 70 days) non-fuel emissions were down to a level of 0.6 gram and continuing to decrease.

No attempt was made to increase the rate at which the non-fuel emission declined. (Non-fuel emission test programs conducted with LDVs have revealed that non-fuel emissions can be substantially reduced from a new vehicle by operating the vehicle for several hours a day or by increasing the temperature of its environment.) Ford Motor Company data on a LDT used in the 1978 model year certification program shows that the non-fuel emissions level for this vehicle was 0.31 grams. This limited data indicates that non-fuel emissions from large HDGs are 0.3 gram higher than these emissions from LDTs.

Ford Motor Company data on LDVs show that a substantial reduction in non-fuel emissions can be achieved by eliminating some of the sealer and sound deadener used in new vehicles. Manufacturers are allowed to use this as well as other techniques (e.g., heating of the vehicle in an oven) in order to reduce background emissions from certification vehicles. Consequently, even though EPA expects that average non-fuel emissions will be higher for heavy-duty certification vehicles than for light-duty certification vehicles, the difference is unlikely to be as large as the 0.3 gram difference indentified above.

Summary

In consideration of (1) the parameters which affect vehicle evaporative emission levels and (2) evaporative emission test results from both HDGs and LDTs, EPA believes that technology is currently available which will allow HDGs which have a fuel tank capacity up to 40 gallons, a carburetor float-bowl volume of up to 150 cc, and a physical size approximatelv equal to LDTs to meet a 2.0 g/test evaporative emission standard.

For vehicles which exceed the parameter sizes listed above, containment of evaporative emissions to achieve a 2.0 g/t level of control has not been demonstrated. The lowest certification evaporative emission level achieved for a LDTs equipped with the largest carburetor gasoline volume currently available on HDGs (268 cc) is 2.2 grams. LDT certification data also indicates that 100-gallon fuel tank(s) may result in 0.3 gram higher evaporative emissions than 40-gallon fuel system. In addition, data indicate that large HDGs may have up to 0.3 gram higher non-fuel emission than LDTs. Consequently, with the use of current technology, a 3.0 g/test standard appears to be lowest feasible level of evaporative emission control applicable to the complete class of HDGs.

Cost and Cost Effectiveness

EPA expects the retail price of HDGs to increase by approximately $34.20 because of the vehicle modifications required to comply with the evaporative emission regulations. All of this cost may be returned in the form of fuel savings if the vehicle manufacturer adopts an advanced, closed-loop fuel metering system. In this case, the evaporative emissions will be captured and returned to the engine to be burned in place of some of the incoming fuel. Closed-loop fuel metering improves the efficiency with which fuel is burned. This fuel savings would be realized regardless of this regulation. However, an additional fuel savings would be realized if this regulation were implemented. This second fuel savings occurs because gasoline normally lost to the atmosphere due to evaporation will be captured and used efficiently.

Some manufacturers may adopt advanced fuel metering systems for improved fuel economy, or other reasons; however, the main incentive would be to reduce engine exhaust emissions. If the 1985 heavy-duty gasoline engine standards are promulgated at the statutory standards (i.e., 75% reduction in NOx), closed-loop systems will probably be widely used by the 1985 model year. Assuming a useful life of 8 years and 114,000 miles (see "Average Lifetime Periods for LDTs and HDVs" in the public docket), a 1985 HDG equipped with an evaporative emission control system and advanced fuel metering should obtain sufficient fuel economy benefits to reduce the lifetime vehicle fuel costs by $41 per vehicle. This calculation is for 1980 dollars, assuming a $1.00/gallon fuel cost, and a discount rate of 10%. This cost savings estimate does not reflect that fuel costs have recently been increasing much more rapidly than the general rate of inflation. If fuel costs rise 5 percentage points per year faster than the general price index, then a discount rate of 5% would be more appropriate in determining the future value of fuel. Using this 5% discount rate results in an estimated lifetime fuel savings of $49 per vehicle. So that any error tends toward overestimation of the costs, we have

used the 10 percent discount rate for fuel in our analysis.

For vehicles which are not equipped with closed-loop fuel metering, the expected $34.20 per vehicle retail price increase will result in a cost-effectiveness for this proposed regulation of $168 per ton of NMHC emission controlled. For vehicles which are equipped with a closed-loop fuel system, the $34.20 retail price increase in combination with the $41 vehicle lifetime fuel savings will result in a cost effectiveness of $–33 per ton of NMHC emission controlled.

To aid in determining costs as accurately as possible, we are requesting all interested parties to submit detailed estimates of any cost increases to the ultimate purchaser (i.e., retail price equivalent) of vehicle modifications required as a result of this regulation. These estimates should be itemized to show the costs of any additional components added to the vehicle or any vehicle modifications required; the savings from components no longer necesssry due to the above component additions; the cost savings of changes in maintenance requirements and fuel consumption; the cost of new testing equipment; and the cost of certification over and above that already requird by applicable gaseous emission regulations.

Appropriate Model Year for Implementation

Vehicle modifications and control system components which will be necessary to meet the requirments of this proposed regulation are essentially the same as those necessary for complying with the LDV and LDT standard of 2.0 g/test for the 1981 model year. The above discussion of technical feasibility has shown that such technolgy is already being used on a substantial percentage of production cars and LDTs. EPA expects that the only substantial difference between light-duty and heavy-duty control systems will be that HDGs with very large fuel capacities will require a larger amount of vapor storage material than will vehicles with light-duty control system. Additional vapor storage material, however, is not a long leadtime item.

EPA has determined, in accordance, with sections 202(a) and 202(b)(1)(C) of the Clean Air Act, that 1983 is the earliest feasbile model year for implementation of this regulation. EPA believes that the modifications requiring the longest leadtime will be careburetor modifications to those carburetor models which have not been used in LDV or LDT applications. The major modification required for these carburetors is venting of the fuel bowl to the vapor storage device(s). This tooling change is expected to take about 10 months. Tooling changes can take as long as 12 months if they are complex and backlogs are high (see International Harvestor Company's (IHC) comments) in the Appendix to the "Regulatory Analysis" in the docket). The tooling change necessary for carburetor venting is relatively simple and well known. Also, backlogs in the tool and die industry are expected to be reduced by 1981 if a slowdown in the economy occurs. For these reasons EPA estimates that after design drawings are released 10 months will be needed to effect this tooling change.

Prior to preparation of the production drawings, the production design must be finalized. The amount of design and development time required in order to determine a final design is dependent on many factors, including the level of the standard, past experience of the manufacturers, level of effort by the manufacturer, and availability of testing facilities. In consideration of manufacturers' past and continuing experience with control of evaporative emissions from LDVs and LDTs (and assuming that test facilities are available for conducting the certification test procedure), EPA believes that design and development time required to finalize the carburetor design will be approximately six months. Since engine production for a 1983 model year begins about September, 1982, the 16 months necessary for production design and tooling changes would require that the necessary control hardware be determined by May, 1981.

IHC commented that 12 months would be necessary for research and development (R&D) to identify effective control systems. EPA expects R&D to be minimal and to a large extent already complete by the time this regulation is finalized since manufacturers have been familiar with the test procedure since March of 1978. As discussed in the technical feasibility issue, the control of evaporative emissions from HDGs which have carburetor and fuel tank capacities similar to LDTs will not be more difficult than control of evaporative emissions from LDTs. In view of the fact that (1) the majority of current HDGs have carburetor and fuel tank capacities within the range covered by LDTs, and (2) most LDTs have certified to an evaporative emission level of under 3.0 g/t, the hardware required for compliance with this proposed standard has already been defined for the majority of HDGs. Those vehicles which have fuel tank capacities greater than LDTs will need a proportionately larger amount of vapor storage capacity; however, tests have shown that control to a 3.0 g/t level is feasible for these vehicles. Consequently, the process of defining the required hardware is to a large extent already completed.

In conclusion, if the vehicle manufacturers have determined the necessary control hardware by May of 1981, EPA believes that the proposed standard of 3.0 g/t can be implemented with 1983 model year vehicles. EPA expects that all manufacturers will be able to determine the necessary control hardware by May of 1981 because the technology required is the same as that used in LDV and LDT evaporative emission control. The equipment which is currently being used for LDT certification is generally adequate for testing of 8,500–14,000 pound GVWR vehicles, which include the majority of HDGs. For vehicles greater than 14,000 pounds GVWR the use of bench testing is expected to give results which are in good agreement with the full test procedure. Ford has already developed a component testing procedure which appears to correlate quite well with the full SHED procedure (see the docket). In fact, the major reason EPA is proposing the full test procedure is to ensure that the manufacturers' bench tests are designed to accurately assess evaporative emission control systems. EPA expects that the bench tests will correlate well with the full test procedure and that the full test procedure will only be necessary to establish and confirm that correlation. Although it is likely that manufacturers will have full test procedure capacity by May 1981, since in March 1978 EPA provided industry with a draft test procedure, full test procedure capacity is not a prerequisite to determining the necessary control hardware. Thus, the necessary control hardware, if not already defined, should easily be defined by May 1981.

Major Vehicle Classification and Compliance Issues

Vehicle Classification

All vehicles will be classified according to evaporative emission family and evaporative emission control system. The proposed regulations define the evaporative emission family by vehicle parameters which contribute to the evaporative emissions of the vehicle. The parameters include the nominal fuel tank capacity (within 20 gallons, or within 25 percent, whichever is greater), the method of fuel/air metering (i.e.,

carburetor vs. fuel injection), and the carburetor fuel bowl volume (within a 10cc range). An evaporative emission control system is defined in the proposed regulations by those vehicle parameters which control evaporative emissions. To be classed in the same evaporative emission control system, vehicles must be identical with respect to the method of vapor storage, the vapor storage material, the vapor storage working capacity (within 20g), the method of purging stored vapors, and the method of carburetor fuel bowl venting during both engine operation and engine off.

Vehicles grouped within the same evaporative emission family-system combination are expected to exhibit similar evaporative emission levels, and this will facilitate the selection by EPA of vehicles within a family-system combination which are expected to produce the highest emissions within that family-system combination (worst cases).

This organization of evaporative emission families and evaporative emission control systems does not imply and presumption on the part of EPA of a unique deterioration factor (deterioration factor, d.f., is discussed as the next issue) for each family-system combination. The manufacturer is therefore required to determine the appropriateness of single or multiple evaporative emission deterioration factors which are necessary to adequately cover the evaporative emission family-system combinations within his product line. It may be possible for a particular d.f. to apply to one evaporative emission family or to several, or to apply to portions of several evaporative emission families. The primary consideration in the organization of evaporative emission families and control systems is to segment a manufacturer's product line to allow for the selection of worst case emission-data vehicles which would most appropriately represent other untested, less severe calibrations within an evaporative emission family.

Determination of Durability and Evaporative Emission Control System Deterioration

EPA is currently unable to specify a single test procedure for the evaluation of vehicle evaporative emission control system deterioration during the useful life of the vehicle. EPA has, however, identified environmental and usage parameters which affect the durability of evaporative emission control systems during their useful life. These parameters are: vibration, the vapor load-purge cycling of the vapor control system, and the aging effect of heat and ozone. Thus, for the purpose of satisfying the requirement of the Clean Air Act, that EPA evaluate the durability of evaporative emission control systems for their useful lives, the proposed regulations require each manufacturer to specify in his Part I application for certification the test procedures he will use to evaluate the durability of his evaporative emission control systems and to develop a deterioration factor for such systems. The data from these test programs and the derived d.f. are required to be submitted with the manufacturer's Part II application for certification.

Simulation of the parameters identified in the preceding paragraph is not adequately accomplished by use of the Durability Driving Schedules contained in Appendix IV to Subpart A of the regulations. The nearly continuous vehicle operation required by that schedule is not typical of the normal vehicle usage which would be expected to affect evaporative emission control system durability. Likewise, the proposed Heavy-Duty Vehicle Evaporative Emission Service Accumulation Schedule contained in Appendix XII, which is used only to stabilize an evaporative emission-data vehicle's evaporative emission control system prior to compliance testing, is also inappropriate for durability service accumulation.

It should be noted that the definition of "useful life" for gasoline-fueled HDVs has been changed. This change is part of the recently promulgated heavy-duty *gaseous* (HC and CO) emissions package which is to be implemented in 1984. Thus, for the first year (1983 MY) of these heavy-duty *evaporative* emissions regulations the old definition of useful life will apply (i.e., 50,000 miles). Then in 1984 "useful life" will be "the average period of use up to engine retirement or rebuild, whichever occurs first, as determined by the manufacturer under § 86.084–21(b)(4)(ii)(B)" of Title 40 of the Code of Federal Regulations (CFR).

EPA is concerned about the contribution to vehicle evaporative emissions from permeable fuel tanks (e.g., plastic fuel tanks) during the useful life of the vehicle. The different plastics, and the different treatments of the plastics available to the industry, make any position EPA might take on the inclusion of permeable fuel tanks on emission-data vehicles, or in the durability evaluation process, of little value. The EPA, therefore, specifically requests comments on the general permeability and rate at which fuel diffuses through non-metal fuel tanks and the best method for incorporating these permeability considerations in predicting the contribution from this source to evaporative emission control performance deterioration.

Emission-Data Vehicle Selection

The proposed regulations would require the Administrator to select one vehicle to represent each evaporative emission family-system combination. Up to two additional vehicles may be selected from each evaporative emission family.

There are no rigid requirements for the criteria used in selecting these vehicles (e.g., expected high emissions or manufacturer's projected sales). EPA may use whatever criteria appear appropriate for a given manufacturer's product line. For an evaporative emission family made up of several family-system combinations, none of which singly represent a significant portion of the evaporative emission family sales, vehicle selection may be based upon anticipated high emissions. For a family made up of a few family-system combinations, one of which represents a major portion of the evaporative emission family sales and hence has the greatest potential to affect air quality, vehicle selection may be based upon projected sales volume.

For the purposes of selecting evaporative emission-data test vehicles, information other than that pertaining to the evaporative emission family and evaporative emission control system will be supplied by the manufacturer. The information is necessary in the event that EPA chooses to make a worst case vehicle selection within an evaporative emission family-system combination. The information required will include the cylinder block characteristics (e.g., in line or vee), the method of aspiration, rated horsepower, rated torque, compression ratio, catalyst and/or thermal reactor characteristics, inertia weight class, road-load horsepower, and engine compartment type (e.g., cab-over, engine forward). The Administrator may also require additional information such as the total weight of the engine (including carburetor, manifolds and all engine driven accessories), transmission options, axle ratios, N/V ratios and engine coolant thermostat setting.

Treatment of Incomplete Vehicles

The development criteria for the selection of test vehicles to represent a manufacturer's incomplete vehicles included a substantial amount of investigation on EPA's part. Information concerning the configuration and the

degree of incompleteness of vehicles within their product line was requested of Ford, General Motors, Chrysler and International Harvester. Additional information was also requested from the Motor Vehicle Manufacturers Association and the Truck Body and Equipment Association concerning the completion and modification of incomplete vehicles by secondary manufacturers.

EPA's intentions in soliciting information from the manufacturers and the industry associations were fourfold.

1. To identify the basic forms in which incomplete vehicles are manufactured.

2. To determine the extent and type of modifications made to the incomplete vehicle during its completion which could affect the vehicle's evaporative emissions.

3. To determine the representativeness of the various forms of incomplete vehicles for evaporative emission testing of the final completed vehicle.

4. To determine which, if any, of the incomplete vehicle forms are suitable for evaporative emission testing considering such parameters as the completeness of the engine compartment, the presence of an operator's enclosure, and the effect that the cargo carrying device might have on the entrapment of exhaust heat in the vicinity of the fuel tanks and lines.

The manufacturers, in general, stated that the completion or modification of incomplete vehicles is performed either by their dealers or through secondary manufacturers, and that they had no knowledge of the condition of the vehicle in final form. The associations representing the primary and secondary manufacturers stated that they were also unable to supply the requested information since it was not normally supplied by their members. The proposed regulations, therefore, place an emphasis on the incomplete vehicle, as it is originally manufactured, and about which EPA has the greatest information available. The original manufacturer must certify, in a completed vehicle configuration, all incomplete vehicles which it markets.

The manufacturer would determine the limits of a worst case completed vehicle configuration for each incomplete vehicle which he wishes to market. These limits (in addition to those specified by the exhaust emission certificate) would be those defined by the evaporative emission family-system combination and the evaporative vehicle configuration, i.e., fuel tank volume, carburetor bowl fuel volume, method of vapor storage, vapor storage material, vapor storage working capacity, method of carburetor bowl venting, vapor purging technique, fuel system, maximum GVWR, maximum frontal area, body type, and other features as specified by the Administrator. The incomplete vehicle would then be certified to these limits incorporated in the completed vehicle which is actually tested. A secondary manufacturer or dealer who completes a vehicle for sale would only have to remain within the limits of the certified worst case configuration in order to be covered by the original certificate. If, however, a secondary manufacturer exceeds the limits to which the original vehicle was certified, (e.g., by the addition of a fuel tank), then the secondary manufacturer would have to conduct his own certification program.

EPA has estimated the number of evaporative emission-date vehicles which might be required by the proposed evaporative emission family and system classifications and the above vehicle selection criteria. EPA realizes these estimates are crude and, therefore, specifically requests comments on the number of evaporative emission families and systems, and on the number of evaporative emission-data vehicles which would result from the proposed regulations.

Treatment of Small Sales Volume Evaporative Emission Family-System Combinations

As a result of the information submitted by the MVMA and by some manufacturers, it has become apparent that the development and certification of evaporative emission control systems for vehicles with low sales volumes may be difficult and expensive on a per vehicle basis. This would be particularly true if a small sales volume vehicle configuration within an evaporative emission family-system combination was likely to be considered a worst case, and therefore likely to be selected by EPA as an emission-data vehicle. The manufacturer might then have to undertake a vehicle oriented development and certification program to ensure that this worst case vehicle would pass certification testing where the number of development and certification vehicles required might represent a significant portion of the entire yearly production of the vehicle.

Some manufacturers have suggested that a reduced testing requirement, or a testing exemption, be allowed for small sales volume evaporative emission family-system combinations. EPA does not believe that sufficient information is available at this time to justify proposing such an exemption. Also, we are unable to specify a compliance procedure which would be compatible with a reduced or eliminated testing requirement. EPA, therefore, specifically requests comments on any need or desirability for allowing a reduced testing requirement. Any such comments should also include specific recommendations by which the compliance of an evaporative emission family-system combination could be demonstrated within the context of a reduced testing requirement.

Reduction in Evaporative Emission-Data Vehicle Testing

The proposed regulations contain a provision which would allow for a reduction in the number of evaporative emission-data vehicles required. Upon request by the manufacturer, and with the presentation of acceptable data to support his request, the Administrator may allow the certification of an evaporative emission-data vehicle or evaporative emission control system based on successful testing of another vehicle or system within the same evaporative emission family. The Administrator's approval would be based upon actual data from previous model years' certification testing, manufacturer's vehicle testing, or component testing data which demonstrate that the vehicle or system which was selected for testing would exhibit lower evaporative emission levels than another vehicle to be tested.

EPA requests comments from the manufacturers on the feasibility and effectiveness of their demonstrating, with data, the relative evaporative emission levels to prove worst cases. With regard to EPA's request for comments concerning the number of evaporative emission-data vehicles that these regulations would require, EPA also requests comments on the effect of allowing worst case demonstrations on reducing those estimates.

Issuance of Certificates of Conformity

The current exhaust emissions test procedure for gasoline-fueled heavy-duty engines requires the use of an engine and an engine dynamometer. The proposed EPA evaporative emission test procedure for gasoline-fueled heavy-duty vehicles requires the testing of vehicles on chassis dynamometers since the size and configuration (e.g., thermal output and fuel/air metering) of the engine installed in a vehicle will have an effect on the evaporative emission levels of the vehicle. Therefore, exhaust and evaporative emission certification testing will be conducted separately from each other. The emission data derived from these two different test procedures represent two distinct populations; one for engines as an entity

separate from the vehicles, and one for the completed vehicle.

The proposed regulations would result in the issuing of two separate certificates; one in recognition of exhaust emission compliance, and one in recognition of evaporative emissions compliance. The certificate of conformity with exhaust emissions will be issued for each engine family with no change in the current procedure. The certificate of conformity with the evaporative emission standards will be issued for each evaporative emission family and will include a list of those engines certified for exhaust emissions which may be installed in the vehicle in conjunction with the evaporative emission family-system combination. The provision requiring prior exhaust emission certification is made in recognition of the engine's influence on evaporative emissions. Furthermore, EPA recognizes that a heavy-duty engine may be sold separately from a vehicle, and therefore separate from such major components of the evaporative emission control system as the charcoal canister. The issuance of two certificates would prevent any delay in the certification of an engine family due to differences in evaporative vs. exhaust emission test scheduling.

Nonconformance Penalties

Section 206(g) of the Clean Air Act states that "In the case of any class or category of heavy-duty vehicles (HDVs) or engines to which a standard promulgated under section 202(a) of this Act applies * * *", a manufacturer shall be issued a certificate of conformity for such vehicles or engines even if they fail to comply with that standard, if the manufacturer pays a nonconformance penalty (NCP) and the degree by which the vehicles or engines fail to meet the standard does not exceed the percentage determined to be practicable.

The Agency recognizes that newly assembled heavy-duty vehicles may have background emissions of hydrocarbons that are unrepresentative of typical in-use background levels. It is likely that manufacturers would want to minimize these emissions, by artificial aging or other procedures, before subjecting those vehicles to evaporative hydrocarbon testing. For vehicles which are produced in an incomplete form, it may be necessary to substantially modify the vehicles before evaporative testing may be performed (such as by enclosing the engine to accurately simulate underhood temperatures during the latter part of the evaporative test procedure). We believe that significant delays and costs are associated with these preparations which may be required to perform a Selective Enforcement (SEA) for evaporative emissions. Because of these difficulties, this proposal does not include a SEA provision.

In addition, these regulations do not propose a NCP for manufacturers whose HDVs do not meet the evaporative emission standard during certification. In order for a NCP to be made available in conjunction with the evaporative emission standard, a procedure must be developed to test for evaporative emissions from production HDVs. The legislative history behind section 206(g) states that EPA must assess a NCP based upon results from tests on heavy-duty production vehicles or engines. Thus, the difficulties associated with evaporative testing of assembly line vehicles must be resolved before a NCP can be proposed.

This proposal establishes a HDV evaporative emission standard at a level set according to a technically feasible level of control. However, EPA is willing to provide a NCP for isolated unforeseen circumstances when compliance may not be achieved if the problems associated with performing testing on production heavy-duty vehicles or engines can be over-come. Comments are invited on the need for a NCP for the proposed HDV evaporative emission standard. Commentors should also address suggested means for preparing production HDVs for evaporative testing, in order to implement a Production Compliance Auditing (PCA) system (similar to that proposed in Section 86.1011–83 of Subpart K for light-duty trucks and heavy-duty engines) for quantitative determination of evaporative emissions, to enable manufacturers to take advantage of any NCP.

If manufacturers perceive a need for the NCP and describe, in detail, the procedures they would use to prepare complete or incomplete HDVs for evaporative testing according to the PCA system referenced above, the Agency will establish a NCP in a separate rulemaking (similar to that proposed in § 86.1013–83 of Subpart K for light-duty trucks and heavy-duty engines). Since the availability of such preparatory procedures will make Selective Enforcement Auditing more feasible, commentors should address the application of these procedures to a SEA program (similar to that proposed in section 86.1010–83 of Subpart K for ligfht-duty trucks and heavy-duty engines).

Major Test Procedure Issues

In specifying the HDG test procedure given here, EPA has made an effort to duplicate the LDV/LDT test procedure when ever reasonable and practical. There are, however, a few areas in which changes were necessary because of differences in the physical and operating characteristics of LDVs and LDTs versus HDGs. Those changes which are of major importance and those issues which were of greatest concern to the manufacturers (as evidenced by their comments to the Draft Recommended Practice which was sent to them in March, 1978) are discussed below.

Basic and Alternate Test Procedures

The existing evaporative emission test procedure for light-duty vehicles and light-duty trucks[1] requires vehicle operation on a dynamometer on two occasions during the test sequence. The first occasion is during vehicle preconditioning, which is intended to remove unwanted influences on the test results due to a vehicle's past operating experience. Vehicle preconditioning is also intended to provide a representative amount of purging (air flow) through the vapor storage system prior to the first part (heating of the gasoline in the fuel tank to simulate the diurnal temperature change) of the emission measurement procedure. The second occasion is after this diurnal test. During this second vehicle operating period, (1) running losses (evaporative emission losses which occur during running of the vehicle on a chasis dynamometer) are determined, (2) the storage system is again purged, and (3) the fuel system is warmed in preparation for the last part (the hot soak loss) of the emission measurement procedure. The latter two occurences are the major purposes of the second operating period, since running losses can usually be determined to be zero without the need for a test.

Operation for light-duty vehicles on these two occasions consists of driving over the EPA Urban Dynamometer Driving Schedule for Light-Duty Vehicles and Light-Duty Trucks (Appendix I(a) of Part 86). Because the operating patterns for heavy-duty vehicles are significantly

[1]Light-duty vehicles and light-duty trucks (i.e., trucks with a Gross Vehicle Weight Rating not more than 8,500 pounds) are distinct classes of motor vehicles under EPA regulations, but have similar operating characteristics and are tested using basically similar test procedures. Further, references to the operating characteristics of light-duty vehicles imply the operating characteristics of both classes. References to the light-duty vehicle test procedure imply the test procedure common to both classes.

different than those represented in this cycle, a new driving schedule representative of heavy-duty vehicle urban operation was needed.

From the data gathered in a survey of in-use heavy-duty vehicle urban operation,[2] EPA has developed a representative transient chasis dynamometer driving schedule (speed vs. time relationship) for heavy-duty vehicles. Such a transient driving cycle, with representative dynamometer loading, is appropriate for vehicle operation in the evaporative emission test procedure. This driving cycle has been included in the test procedure being proposed today, as the reference dynamometer driving schedule.

EPA will use the reference dynamometer driving cycle for all confirmatory certification testing. However, EPA does not wish to impose the higher cost that may result if manufacturers were required to test complete vehicles using the reference driving schedule for all their certification testing, given that a steady-state cycle may satisfactorily test the performance of evaporative emission control systems and given that it may also be possible to develop other test methods which give equivalent results to the EPA test procedure. EPA, therefore, proposes to allow manufacturers to use simpler, alternate test methods. However, this proposal can be implemented only so far as it will not reduce the effectiveness of EPA's emission control program.

It is probable that a control system could be designed which would produce low evaporative emissions when tested using a simpler test method, e.g., with a steady-state driving cycle, but which would produce higher emissions under in-use urban conditions or when tested using the transient driving cycle. This may result by designing, either intentionally or unintentionally, to the specific requirements of the simpler test method. If EPA were to establish certification and test procedures that required it to certify a heavy-duty vehicle as being in compliance with an evaporative emission standard based only on the results of a simple test method, the intent of the standard would likely be defeated.

In order to assure the regulation's effectiveness while retaining for manufacturers and purchasers of new heavy-duty vehicles the cost advantages of simple test methods, EPA proposes the following policy. When certification procedures require a manufacturer to submit test data for the evaporative emissions of a vehicle, the manufacturer may collect the data using either test method: The test procedure being published here with the reference driving cycle, or a test method (component or vehicle test) devised by the manufacturer. Advance approval by the Administrator will be required for the latter method, but not for the first method. In order to get this approval the manufacturer must show that its devised method gives results which correlate with in-use emissions. This correlation can be shown by demonstrating equivalence of results with the EPA test procedure being published here.

After the manufacturer submits its test data, EPA will have two options:

(1) EPA may decide to test the vehicle, in which case the manufacturer shall build the vehicle if it has not already done so as part of its own testing. The results of the EPA test will be the official test data. EPA will use the reference test procedure being published here.

(2) EPA may decline to test the vehicle itself. The manufacturer's test data will then be accepted as the official data: *Provided,* That if the Administrator makes a determination that there is a lack of equivalency between the manufacturer's test procedure and the test procedure used by EPA, the manufacturer's test data will not be accepted for purposes of certification until the reasons for the lack of equivalency are determined and the validity of the data is established by the manufacturer.

These options are similar to those available to EPA under the existing light-duty vehicle and light-duty truck certification procedures.

By giving EPA the option of conducting a confirmatory test using the reference dynamometer driving cycle, this policy provides the necessary protection against control systems which give a typically low evaporative emissions when tested using a steady-state driving cycle or a component test method devised by the manufacturer, while allowing the manufacturer the maximum flexibility with respect to test procedure. By requiring a showing of equivalency between the manufacturer's devised test method and the EPA test procedure, the policy protects against faulty test methods even when EPA decides not to test a vehicle.

Some manufacturers may find it impossible to rely on alternate test methods and still have enough confidence of successful certification in the event EPA performs an official test with the transient driving cycle. For these manufacturers, the most cost-effective approach may be to acquire a new dynamometer to allow the manufacturer to use the transient driving cycle in all its tests. However, Ford has developed a component test procedure (see the docket) which appears to correlate well with the vehicle enclosure technique. Also, EPA's experience with the steady-state dynamometer cycles and component tests (see the docket) suggest that all manufacturers should be able to use alternate test methods that both reduce certification costs and provide adequate confidence of successful certification.

The use of alternate test methods (i.e., a steady-state cycle or other methods devised by the manufacturer) may affect the ability of a manufacturer to obtain certification for one model year based on official test data from a previous model year. Even though EPA may for some reason accept data from an alternate procedure as a basis for certification one year, carry-over to the next model year could be denied (even though no changes may have been made in the system design) should EPA decide it is necessary to conduct a confirmatory test.

Representativeness of the Driving Cycle

In response to the Draft Recommended Practice published in March, 1978, several manufacturers questioned the representativeness of the driving cycle. Many of the comments arose because that document contained no technical explanation of how EPA developed the driving cycle from data collected in the operational survey of in-use heavy-duty vehicles. These comments have not led EPA to substantially modify the cycle. Minor changes have been made. A clerical error in the cycle has been corrected by deleting one second of operation at each of three points, and the length of the initial idle has been reduced.

EPA maintains that the transient cycle specified in this test procedure is representative of the urban operation of gasoline-fueled heavy-duty vehicles. Reports supporting this conclusion have been placed in the public docket for this rulemaking and are available for inspection and copying as described at the end of this document.

Representativeness of the Diurnal Test

The existing test procedure for light-duty vehicles requires a diurnal breathing loss test segment in which the fuel tank is heated from 60°F to 84°F in a period of one hour. This segment simulates the fuel heating which occurs

[2] A series of reports describing this survey (CAPE-21 Project) and its results, and their use in developing the chassis dynamometer driving schedules specified in this test procedure has been placed in the public docket for this rulemaking. These reports are available for inspection and copying as described below.

during a summer day. Two manufacturers commented that differences in the physical and operating characteristics of LDVs and LDTs versus HDVs make the diurnal portion of the LDV test procedure unrepresentative of HDVs. Two claims were made:

(1) Since fuel tanks on some heavy-duty vehicles are larger than those on light-duty vehicles and trucks they tend to have a smaller temperature fluctuation during a typical summer day;

(2) Heavy-duty vehicles tend to be used for commercial rather than personal transportation and as a result are operated more frequently during the day than are light-duty vehicles. This periodically purges the vapor storage system, which then does not have to store the full diurnal vapor load at once.

One manufacturer suggested that the HDV procedure use a temperature increase of less than 24°F, over the same one-hour period. The other manufacturer suggested both a temperature increase of less than 24°F and a period of less than one hour.

Neither suggested specific values for a different temperature increase or test duration.

EPA recognizes that if two fuel tanks are similarly located on a vehicle and exposed to similar ambient temperatures and solar radiation, the temperature of the fuel in the larger tank will rise more slowly. However, the larger fuel tanks on heavy-duty vehicles tend not to be located like those on light-duty vehicles and trucks. Instead, they are often attached to the exterior of the vehicle and are more exposed to both ambient air and solar radiation. It is thus not evident from theoretical considerations alone whether their diurnal fuel temperature variations are larger or smaller than those for light-duty vehicles. EPA has measured the summertime fuel temperatures in a 189-liter (50-gallon) fuel tank on a heavy-duty vehicle and concluded that the 24°F temperature rise used for light-duty vehicles is also appropriate for heavy-duty vehicles.

Regarding the more frequent operation, and consequent purging, claimed for heavy-duty vehicles, it is true that many LDVs are driven only twice a day, once in the morning and again in the late afternoon, whereas many HDVs are operated more often during the day. However, these are opposite extremes in the different spectrums of operating patterns for the two classes and are not strictly representative for either class of vehicle. The twice-a-day operation would be typical of vehicles used as transportation to and from work on weekdays. Not all LDVs are operated like this, however, since LDVs in commercial fleets and some "second cars" are used more frequently. Similarly, many of the HDVs that are operated frequently on weekdays are not operated at all on weekends.

For an evaporative emission test procedure to be truly representative of the operating patterns of a class of vehicles, the SHED segments of the test would have to be interrupted by periods of vehicles operation on a dynamometer. There would be no distinct diurnal and hot soak tests. In addition, since the mass of hydrocarbon vapors given off during a diurnal period depends on the duration of the period as well as the change in fuel temperature, the SHED segments would have to be several hours long. The exact sequence of SHED and dynamometer segments would have to be determined from the operating characteristics of the particular class of vehicles to be tested. The sequence would be somewhat different for LDVs than for HDVs, but not as different as would appear from the opposite extremes described above.

A truly representative test for evaporative emissions from light-duty vehicles would not resemble the existing light-duty test procedure. It would be longer, require more operations and transfers of the vehicle from one test area to another, be more costly, and produce a different value for the mass of evaporative emissions. EPA's policy for light-duty vehicles has been to compromise the strict representativeness of the evaporative emissions test procedure in order to make it manageable for both the manufacturers and EPA to conduct. The existing LDV test procedure does retain enough realism to ensure that vehicles which are successfully certified will also have reduced in-use evaporative emissions, and that the technology used to achieve these reductions will be reasonably cost effective.

EPA's policy for heavy-duty vehicles is similar. It is EPA's judgment that, given the extent of other, unavoidable compromises from a strictly representative test procedure, the difference in the frequency of operation of light-duty vehicles and heavy-duty vehicles is not so great as to require a compensating change in the temperature rise during, or the duration of, the diurnal segment of the procedure for heavy-duty vehicles, the HDV test procedure being proposed today retains enough realism to achieve its purpose.

Representativeness of the Hot Soak Test

The representativeness of the hot soak test, in particular of the one-hour test duration specified in the test procedure being published today, is an issue similar to the representativeness of the diurnal test. In principle, the duration of the hot soak test should be representative of the period a vehicle is parked with the engine warm enough to cause evaporative losses. This can occur betwen trips and after the last trip of the day. There is a distribution in the length of these periods for any one class of vehicles. Surveys of in-use vehicles have shown that the distributions differ for light-duty vehicles and heavy-duty vehicles.

Most hot soak periods of in-use light-duty vehicles are over one hour in length. In order to reduce the time required for an emission test, EPA adopted a one-hour hot soak for testing purposes. A one-hour test measures most, but not all, of the evaporative emissions that would be measured if the test lasted several hours. Experience with the LDV procedure has established a need to lengthen the hot soak period. Manufacturers design their carbon canisters to hold the emissions from the one hour period. However, intances where the canister becomes over-loaded have occurred. Apparently, these canisters did not have sufficient capacity to hold the extra evaporative emissions that are given off after the 1 hour soak period has ended.

In contrast to LDVs, most hot soak periods of in-use HDVs are under one hour in length. In the sample surveyed in the study of the urban operation of in-use gasoline-fueled HDVs, about 84% of all hot soak periods were less than one hour in length. Because a long soak produces more emissions than a short soak, the longer soaks are more significant than their frequency indicates. Counting all hot soaks, only about 48% of the evaporative emissions occurred during the first 15 minutes. This means that if the observed median time (approximately 15 minutes) were chosen as the hot soak time in the test procedure 52% of the presently uncontrolled evaporative emissions from gasoline-fueled heavy-duty vehicles would potentially remain uncontrolled after a standard is in effect. Even with a one-hour soak test time, about 12% remains potentially uncontrolled.

In consideration of the above, EPA has decided to specify a one-hour hot soak in the test procedure being promulgated here. This should not be considered a departure from the regulatory philosophy of the existing light-duty test procedure, in which the specified soak period is shorter than the median in-use soak period. Rather, it is a case in which it has not been

necessary to compromise with the demands of limited testing resources.

Inertia Test Weight and Road Load

In order to operate a vehicle through a transient driving cycle on a dynamometer, the inertia test weight and road load settings must be specified and the dynamometer adjusted accordingly. These should be chosen to be characteristic of the loaded vehicle weight (curb weight plus payload) and road load (aerodynamic losses plus tire losses) of in-use vehicles in urban operation.

EPA considered two approaches to defining loaded vehicle weight. One was to define the loaded vehicle weight as vehicle curb weight plus some fraction of payload capacity. The second approach was to define the loaded vehicle weight simply as some fraction of GVWR. After analyzing available in-use truck weight data, particularly 1977 data from the Federal Highway Administration, EPA had determined that the average in-use weight of gasoline-fueled HDV in urban areas is 70 percent of the vehicle's GVWR. Therefore, loaded vehicle weight has been defined as 70 percent of the GVWR. (In the special case for which a test vehicle's actual weight is greater than 70 percent of the GVWR, the loaded vehicle weight will be defined as the actual weight of the test vehicle.)

As for road load, the test procedure being published here specifies an equation adapted from a recommended practice of the Society of Automotive Engineers (SAE Recommended Practice j688). The adaption involved a correction for the power dissipated in the tires in contact with the dynamometer rolls, which need not be duplicated by the dynamometer power absorption unit Manufacturers that had an opportunity to comment on EPA's decision to use this equation questioned its validity in general, and its validity for heavy-duty vehicles which are aerodynamically like light-duty trucks (i.e., for pickup trucks and vans with gross vehicle weight ratings above 8500 pounds) in particular.

EPA recognizes that the accuracy of the specified equation has not been demonstrated to the extent that similar equations for light-duty vehicles have been. Nevertheless, the equation is the best known method for predicting the road load power losses for HDVs as a class, and is adequate for the purposes of this test procedure. (EPA plans to initiate a procurement action for the conduct of a study of road load characteristics of HDVs. The results of this study will not be available for more than a year. When these results are available, EPA will review them and consider any need for revising the road load equation).

Some manufacturers suggested that separate equations be developed for different subcategories of the HDV class in order to more accurately predict the road load for each. The scarcity of existing data and the large diversity of HDVs make this an impractical task for EPA. Further, EPA does not consider this additional complication to be necessary since the test procedure does allow a manufacturer to use an alternate road load setting for vehicles which qualify to be certified by the light-duty truck (LDT) test procedures (optional certification provision, § 86.079–1(b)).

One method which will be approved routinely for vehicles that qualify for certification by the LDT procedures is the "coastdown method" presently available for light-duty vehicles. For pickup trucks and vans which meet this same requirement, a second method will also be approved. This method consists of using a road load horsepower determined by replacing the aerodynamic loss term (i.e., the first term) of the road load equation in § 86.1229–82(a)(2)(ii) of this HDV test procedure with the road load horsepower which would have applied if the pickup truck or van had been certified as a light-duty truck (given in § 86.129–80(b)), and retaining the tire loss term (i.e., the second term) of the equation. EPA will approve this second method for heavy-duty vehicles that are about the same size and shape as light-duty trucks (i.e., frontal area not exceeding 46 square feet), because it is expected that the light-duty estimate is more accurate for these vehicles than the estimate contained in the HDV equation being specified here. It is necessary to retain the tire loss term in the HDV equation because the actual tire losses for a loaded HDV on the road are not fully duplicated by the tire losses for the unloaded HDV on the dynamometer. For these vehicles, the administrator may also approve other methods for determining vehicle road load in addition to those identified above.

For vehicles which are too large to qualify for optional LDT certification procedures, EPA will not allow alternatives to the dynamometer load specified in these regulations. The reason for this is that vehicle categorization criteria for test vehicle selection purposes will result in vehicle groups which contain a large diversity of vehicles. Vehicles within groups will vary widely in their weight, frontal area, shape, number and size of tires, and other factors that affect road load. Because of this wide diversity of vehicles which a particular test vehicle will be chosen to represent, there is little reason to be very regorous in the road load determination of that one particular vehicle. Consequently, EPA will use the road load equation specified here for all test vehicles which do not qualify for certification by the LDT test procedure.

The specified equation for the road load setting requires that the height and width of the vehicle be known. Many heavy-duty vehicles are produced as incomplete vehicles by one manufacturer and completed by another manufacturer or by the ultimate purchaser. Under present marketing arrangements, the original manufacturer may not know the ultimate dimensions of a vehicle at the time it sells it. EPA proposes that this situation be handled similarly to what is currently done for incomplete LDTs, i.e., the original manufacturer certify the incomplete vehicle to a maximum height and width. A special frontal area problem arises in the case of tractors. For such vehicles, the frontal area will be specified by either one of two methods: Using (1) the actual height and width of the tractor, or (2) using a height of 13.5 feet and a width of 8.0 feet.

Equitable Treatment of Light-Duty and Heavy-Duty Vehicles

Several Manufacturers commented that the proposed test procedure for heavy-duty vehicles is more stringent than the existing test procedure for light-duty vehicles. The reason given was that the HDV driving schedules contain less time during which engine operating conditions allow purging of the storage system to take place. The manufacturers went on to claim that this would cause inequitable treatment of the two vehicle classes.

The HDV driving schedules to give less time for purging than the LDV schedule, for two reasons. EPA's operational survey of HDVs showed that the trip durations for HDVs in urban areas are shorter than for LDVs; this is reflected in the HDV driving schedules being shorter than the LDV schedule. Also, the survey showed that a larger fraction of each trip consists of idle operation; this is reflected in the HDV schedules as well. However, the higher power output of engines in HDVs means that more purging can be done in a fixed period of time without any greater effect on air-fuel ratio. The comparative stringency of the two test procedures is thus not as certain as the manufacturers claim.

In any case, equitable treatment of the two vehicle classes depends on the

levels of the two emission standards, not on the test procedures alone. The criterion for judging a test procedure should be the correlation between emissions as measured with the procedure and in-use emissions. EPA believes this correlation for the test procedure being proposed today to be adequate. The Agency considered the stringency of this HDV test procedure when proposing the level of the emission standard. While we have not agreed that the heavy-duty test is more stringent, we considered this uncertainty in proposing the 3.0 g standard instead of a 2.0 g standard.

The section numbering of the test procedure being published here parallels that of the light-duty test procedure, both for ease of reference and in case future regulations require exhaust emission testing of heavy-duty vehicles.

Minor and Technical Differences Between LDV and HDV Procedures

There are several minor and technical differences between the test procedures for light-duty vehicles and heavy-duty vehicles which are not discussed above. Most of these differences are due to corresponding differences in the physical or operating characteristics of the two vehicle classes.

In § 86.1215–83, the basic tolerance with which the driving schedule must be followed is specified as 4 miles per hour (mph) versus 2 mph for the light-duty procedure. Because of their larger size and more complicated transmissions it may be more difficult for HDVs to follow the driving schedule as closely as is required for LDVs. EPA believes the wider tolerance will not have a substantial effect on measured evaporative emissions, and will reduce the number of tests which must be voided. The Agency may reduce the 4 mph tolerance in the future if experience shows that a smaller tolerance is reasonably achievable. Also, when EPA tests vehicles it will follow the driving schedule as closely as possible. Manufacturers may find it necessary to do likewise to achieve correlation with EPA test results.

In § 86.1218–83, the tolerance on the dynamometer coast down time during performance checks is specified as one second or 5 percent of the target time, whichever is greater, versus one second in the light-duty procedure. For large inertia test weights a one second tolerance may not be feasible, whereas a 5 percent tolerance should be. The one second tolerance will continue to be used for inertia test weights that are close to those used for light-duty vehicles.

In § 86.1228–83, downshifting during deceleration modes is not prohibited. Downshifting is prohibited in the light-duty test procedure. The primary rule for the operation of transmissions for both be vehicle classes is that it be representative of in-use operation. EPA does not consider downshifting during decelerations to be typical of the in-use operation of light-duty vehicles. It may be representative for some gasoline-fueled heavy-duty vehicles. In any case, EPA will require that the manufacturer specify the shift points which he is using for decertification testing. These shift points will be included with the manufacturer's Part I application. EPA specifically requests manufacturer's comments on how to determine representative shift speeds for vehicles operating on the driving cycle.

In § 86.131–83, the manufacturer may choose or the Administrator may require the manufacturer to fasten a load to the test vehicle such at the vertical load on the drive axle is equal to or less than the load it would carry if the vehicle were completed and loaded to its specified loaded vehicle weight, if needed to prevent excessive slip between the drive wheel tires and dynamometer roll(s). There is no similar provision in the light-duty vehicle test procedure, although EPA does impose some weight restrictions administratively. Such loading may be required when testing heavy-duty vehicles because of the large inertia test weights of some of these vehicles. Fastening a load to a test vehicle will not result in an unrepresentative road load horsepower, because the road load equation accounts for the actual load on the drive axle during the test.

In § 86.1232–83, the wording has been changed to allow more than 5 minutes between the time vehicle preconditioning on the dynamometer ends and the time the vehicle is parked for the coal soak. Additional time may be needed because of the large size of some heavy-duty vehicles. The maximum time the engine may be operated during the transfer from dynamometer to coal soak parking remains 5 minutes, as in the light-duty test procedure. If transfer takes more than 5 minutes it must be completed by pushing the vehicle. Some manufacturers requested that the maximum engine-on time be extended to 10 minutes. EPA has not granted these requests, since to do so could affect the condition of the vehicle at the start of the test sequence and this could introduce additional variability in the test results.

In the same section, a provision in the light-duty test procedure allowing additional preconditioning with the approval of the Administrator has not been included in the test procedure for heavy-duty vehicles. It is current EPA policy not to approve additional preconditioning of light-duty vehicles except when a vehicle has not been operated for several days prior to the start of the normal preconditioning sequence. Manufacturers should be able to avoid this situation at their own facilities. When the situation occurs at the EPA facility, it is EPA's policy to conduct additional preconditioning as appropriate, under its discretionary authority to do so. Thus, the provision in question is presently not necessary. EPA has chosen to omit it from the procedure being published here.

In § 86.1235–83, the vehicle must be operated on the dynamometer with the engine compartment cover closed. Light-duty vehicles must be operated with the cover open. EPA believes that testing with the cover closed will give more representative engine cooling for heavy-duty vehicles. The Administrator will allow the cover to be open if the manufacturer can show it is needed to provide a representative test.

In the same section, two additional changes have been made to accommodate HDV features not found on LDVs. Drive wheel tires shall be inflated to the maximum gauge pressure recommended to the ultimate purchaser. This will require an inflation pressure greater than 45 psi (the maximum used for LDV testing) on HDVs with high pressure tires. Also, all but one drive axle on vehicles with multiple drive axles will be disengaged whenever needed for safe dynamometer operation.

In § 86.1238–83, three more minutes are allowed between the end of the running loss test and the start of the hot soak test than are allowed in the light-duty procedure. Several manufacturers commented that additional time may be needed to maneuver some vehicles into the SHED because of their large size. Based on tests of light-duty vehicles and trucks, some of whose engines were similar to those of gasoline-fueled heavy-duty vehicles, EPA has concluded that the additional time will not substantially influence the result of the hot soak test. The number of additional minutes is that suggested by the only manufacturer that made a specific request.

One manufacturer requested that some special provision be made in § 86.1233–83 for plastic fuel tanks. The manufacturer was concerned that with the larger volume of fuel which must be heated in a heavy-duty fuel tank, the

specified heating rate might result in damage to a plastic fuel tank. EPA recognizes that this may be possible but has no confirming experience, and the manufacturer did not submit any technical evidence or argument that the problem in fact is a real one. EPA does not wish to discourage the use of plastic fuel tanks merely because they are less convenient to test. Therefore, for HDVs with plastic fuel tanks, EPA will accept the use of heating methods that would not normally be accepted or encouraged for steel or aluminum tanks. This may involve heating via submersible heating elements, for example. The test procedure does not specify a required heating method, so no special provision is necessary for alternate heating methods. When alternate heating methods are not feasible, EPA may approve a slower heating rate and correspondingly longer diurnal test period. A change in the test procedure is not needed to provide for such situations, since the certification procedures will contain a general provision for special test procedures if approved by the Administrator.

Other Comments by Manufacturers

Manufacturers that commented on the Draft Recommended Practice made many suggestions for modifications to it. These have been considered in the development of the test procedure being promulgated today. All suggestions of major importance are covered in the above discussion. Some other suggestions recommended that the test procedure for heavy-duty vehicles resemble that for light-duty vehicles in areas where EPA, deliberately or by oversight, had introduced deviations in the Draft Recommended Practice. Where these suggestions had merit they were adopted. Manufacturers also suggested some deviations from the light-duty procedures. Where these suggestions had merit, they were accepted and the important deviations are discussed above. There were some suggested deviations that EPA believes may have merit, but which have not yet been accepted. All of these are cases where both the light-duty and heavy-duty test procedures may benefit from amendment, but where amendment is not essential. In the interest of promulgating a test procedure for heavy-duty vehicles that is as much like the existing procedure for light-duty vehicles, regarding which the public has had multiple opportunities to comment, we have decided to postpone action on this last group of suggestions. EPA may in the future adopt them for both test procedures at once. Manufacturers' comments that have not been addressed in the above discussion have been addressed in the summary and analysis of comments, which is part of the public docket that is available for inspection and copying as described below.

Comments and the Public Docket

Copies of materials relevant to this rulemaking action are contained in Public Docket No. OMSAPC–79–1 at the U.S. Environmental Protection Agency, Public Information Reference Unit, Waterside Mall, Room 2922 (EPA Library), 401 M Street, SW., Washington, D.C. 20460. (As provided in 40 CFR Part 2, the Agency may charge a reasonable fee for copying services.)

Evaluation Plan

EPA intends to review the effectiveness and need for continuation of the provisions contained in this action no more than five years after initial implementation of the final regulation. In particular, EPA will solicit comments from affected parties with regard to cost and other burdens associated with compliance and will also review data on the evaporative emissions from gasoline-fueled heavy-duty vehicles built before and after implementation of the regulations to determine how effective this measure has been.

Reporting and Recordkeeping Requirements

While the EPA is not aware that this proposed regulation would impose any significant new or additional recording or recordkeeping requirements on affected parties, the Agency specifically invites comments on ways that any such burdens might be reduced.

Under the EPA's new "sunset" policy for reporting requirements in regulations, the reporting requirements in this regulation will automatically expire five years from the date of promulgation, unless EPA takes affirmative action to extend them. To accomplish this, a provision automatically terminating the reporting requirements at that time will be included in the text of the final regulation.

EPA intends to promulgate a final regulation, modified as the Administrator deems appropriate, after considering comments, and in time to apply to the 1983 model year.

Note.—The Administrator has determined that this action is a "Significant" regulation; but, in consideration of the requirements of Executive Order 12044, this action does not *require* preparation of a "Regulatory Analysis". We have, however, voluntarily prepared a document entitled "Gasoline-Fueled Heavy-Duty Vehicles Evaporative Emission Regulations: Regulatory Analysis," which assesses the environmental and economic impacts of this action. Anyone may review and reproduce this document in the EPA Central Docket Section. Copies are also available upon request from the Office of Mobile Source Air Pollution Control (see the address given at the beginning of this document).

Dated: April 17, 1980.

Douglas M. Costle,

Administrator.

EPA proposes to amend 40 CFR Part 86 as follows:

1. The title of Subpart A is proposed to be revised as follows:

Subpart A—General Provisions for Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles, 1977 and Later Model Year New Light-Duty Trucks, 1977 and Later Model Year New Heavy-Duty Engines, and for 1983 and Later Model Year New Gasoline-Fueled Heavy-Duty Vehicles

2. A new § 86.083–2 is proposed and reads as follows:

§ 86.083–2 Definitions.

(a) The definitions of § 86.079–2 remain effective for the 1983 model year.

(b) The following definitions also apply beginning with the 1983 model year.

"Evaporative emission cycle" means one hydrocarbon loading-purging sequence of the evaporative emission storage device(s) as defined by one of the three methods specified in Appendix XII to this subpart.

"Heavy-duty evaporative vehicle configuration" means a unique combination of basic engine, fuel system, body type, inertia weight class and other features as specified by the Administrator.

"Incomplete heavy-duty vehicle" means any heavy-duty vehicle which does not have either the primary load-carrying device, or passenger compartment attached.

3. A new § 86.083–4 is proposed and reads as follows:

§ 86.083–4 Section numbering; construction.

(a) *Section numbering.* (1) The model year of initial applicability is indicated by the last two digits of the 5-digit group. A section remains in effect for subsequent model years until it is superseded. The number following the hyphen designates what previous section is replaced by a future regulation.

Examples: Section 86.077–6 applies to the 1977 and subsequent model years until superseded. If a § 86.080–6 is promulgated it would take effect with the 1980 model year;

§ 86.077–6 would not apply after the 1979 model year. Section 86.077–10 would be replaced by § 86.078–10 beginning with the 1978 model year.

(2) Where a section still in effect references a section that has been superseded, the reference shall be interpreted to mean the superseding section.

(b) *Construction.* Except where indicated, the language in this subpart applies to both vehicles and engines. In many instances language referring to engines is enclosed in parentheses and immediately follows the language discussing vehicles.

4. A new § 86.083–10 is proposed and reads as follows:

§ 86.083–10 Emission standards for 1983 gasoline-fueled heavy-duty engines and vehicles.

(a)(1) Exhaust emissions from new 1980 model year gasoline-fueled heavy-duty engines shall not exceed one of the two following standards, to be selected at the manufacturer's option:

(i)(A) *Hydrocarbons.* 1.5 grams per brake horsepower hour.

(B) *Carbon monoxide.* 25 grams per brake horsepower hour.

(C) *Hydrocarbons plus oxides of nitrogen.* 10 grams per brake horsepower hour.

(ii)(A) *Hydrocarbons plus oxides of nitrogen.* 5.0 grams per brake horsepower hour.

(B) *Carbon monoxide.* 25 grams per brake horsepower hour.

(2) The standards set forth in paragraph (a)(1) of this section refer to exhaust gaseous emissions generated under the conditions set forth in Subpart D of this part and measured in accordance with those procedures. For low-volume manufacturers, as defined in § 86.083–24(e), the test procedure in either Subpart D or Subpart H of this part may be used; however the standards in paragraphs (a)(1)(i)(A) and (a)(1)(i)(C) of this section shall be reduced by 0.5 gram per brake horsepower hour if Subpart H of this part is used.

(b)(1) Evaporative emissions from 1983 and later model year gasoline-fueled heavy-duty vehicles shall not exceed—

(i) Hydrocarbons 3.0 grams per test.

(2) The standard set forth in paragraph (b)(1) of this section refers to a composite sample of fuel evaporative emissions collected under the conditions set forth in Subpart M and measured in accordance with those procedures.

(c) No crankcase emissions shall be discharged into the ambient atmosphere from any new 1980 and later model year gasoline-fueled heavy-duty engine.

(d) Every manufacturer of new motor vehicle engines or vehicles subject to the standards prescribed in this section shall, prior to taking any of the actions specified in section 203(a)(1) of the Act, test or cause to be tested motor vehicle engines or vehicles in accordance with applicable procedures in Subparts D, H, or M of this part to ascertain that such test engines or vehicles meet the requirements of paragraphs of (a), (b), and (c) of this section.

5. A new § 86.083–20 is proposed and reads as follows:

§ 86.083–20 Incomplete vehicles, classification.

An incomplete truck less than 8,500 pounds gross vehicle weight rating shall be classified by the manufacturer as a light-duty truck or as a heavy-duty vehicle. Incomplete light-duty trucks shall be described in the manufacturer's application for certification. The frontal area and curb weight used for certification purposes shall be specified on the label required in § 86.083–35(d). Incomplete heavy-duty trucks must be labeled as required in § 86.083–35(e) and § 86.083–35(f).

6. A new § 86.083–21 is proposed and reads as follows:

§ 86.083–21 Application for certification.

(a) A separate application for a certificate of conformity shall be made for each set of standards and each class of new motor vehicles or new motor vehicle engines. Such application shall be made to the Administrator by the manufacturer and shall be updated and corrected by amendment.

(b) The application shall be in writing, signed by an authorized representative of the manufacturer, and shall include the following:

(1)(i) *All Vehicles and engines.* Identification and description of the vehicles (or engines) covered by the application and a description of their engine (vehicles only), emission control system and fuel system components. This shall include a detailed description of each auxiliary emission control device (AECD) to be installed in or on any certification test vehicle (or certification test engine).

(ii) *Light-duty vehicles and light-duty trucks only.* (A) The manufacturer shall provide to the Administrator in the preliminary application for certification:

(1) A list of those parameters which are physically-capable of being adjusted (including those adjustable parameters for which access is difficult) and that, if adjusted to settings other than the manufacturer's recommended setting, may affect emissions;

(2) A specification of the manufacturer's intended physically adjustable range of each such parameter, and the production tolerances of the limits or stops used to establish the physically adjustable range;

(3) A description of the limits or stops used to establish the manufacturer's intended physically adjustable range of each adjustable parameter, or any other means used to inhibit adjustment;

(4) The nominal or recommended setting, and the associated production tolerances, for each such parameter.

(B) The manufacturer may provide, in the preliminary application for certification, information relating to why certain parameters are not expected to be adjusted in actual use and to why the physical limits or stops used to establish the physically adjustable range of each parameter, or any other means used to inhibit adjustment, are expected to be effective in preventing adjustment of parameters on in-use vehicles to settings outside the manufacturer's intended physically adjustable ranges. This may include results of any tests to determine the difficulty of gaining access to an adjustment or exceeding a limit as intended or recommended by the manufacturer.

(C) The Administrator may require to be provided detailed drawings and descriptions of the various emission related components, and/or hardware samples of such components, for the purpose of making his determination of which vehicle or engine parameters will be subject to adjustment for new certification and Selective Enforcement Audit testing and of the physically adjustable range for each such vehicle or engine parameter.

(2) Projected U.S. sales data sufficient to enable the Administrator to select a test fleet representative of the vehicles (or engines) for which certification is requested.

(3) A description of the test equipment and fuel proposed to be used.

(4)(i) A description of the proposed mileage (or service) accumulation procedure for durability testing.

(ii) For light-duty vehicles and light-duty trucks, a description of the test procedures to be used to establish the evaporative emission deterioration factors required to be determined and supplied in § 86.083–23(b)(2).

(iii) For heavy-duty vehicles, a description of the test procedures to be used to establish the evaporative emission deterioration factors required to be determined and supplied in § 86.083–23(b)(3).

(5) For gasoline-fueled heavy-duty vehicles, the Administrator does not

assume that each evaporative emission family-evaporative emission control system combination will deteriorate in a unique manner during the useful life of the vehicle. The manufacturer shall therefore identify those evaporative emission deterioration factors which shall be applied to the various evaporative emission family-evaporative emission control system combinations which are expected to exhibit similar deterioration characteristics during the useful life of the vehicle.

(6) A statement of recommended maintenance and procedures necessary to assure that the vehicles (or engines) covered by a certificate of conformity in operation conform to the regulations, and a description of the program for training of personnel for such maintenance, and the equipment required.

(7) At the option of the manufacturer, the proposed composition of the emission-data and durability-data test fleet.

(c) Complete copies of the application and of any amendments thereto, and all notifications under §§ 86.083–32, 86.083–33, and 86.083–34 shall be submitted in such multiple copies as the Administrator may require.

(d) Incomplete light-duty trucks shall have a maximum completed curb weight and maximum completed frontal area specified by the manufacturer.

(e) Incomplete heavy-duty vehicles shall have a maximum completed gross vehicle weight and a maximum completed frontal area specified by the manufacturers.

7. A new § 86.083–22 is proposed and reads as follows:

§ 86.083–22 Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certification and selective enforcement audit testing, adequacy of limits, and physically adjustable ranges.

(a) After a review of the application for certification and any other information which the Administrator may require, the Administrator may approve the application and select a test fleet in accordance with § 86.083–24.

(b) The Administrator may disapprove in whole or in part an application for certification for reasons including incompleteness, inaccuracy, inappropriate proposed mileage (or service) accumulation procedures, test equipment, or fuel, and incorporation of defeat devices in vehicles (or on engines) described by the application.

(c) Where any part of an application is rejected, the Administrator shall notify the manufacturer in writing and set forth the reasons for such rejection. Within 30 days following receipt of such notification, the manufacturer may request a hearing on the Administrator's determination. The request shall be in writing, signed by an authorized representative of the manufacturer and shall include a statement specifying the manufacturer's objections to the Administrator's determinations, and data in support of such objections. If, after the review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.078–6 with respect to such issue.

(d) The Administrator does not approve the test procedures for establishing the evaporative emission deterioration factors for light-duty vehicles and light-duty trucks. The manufacturer shall submit the procedures as required in § 86.083–21(b)(4)(ii) prior to the Administrator's selection of the test fleet under § 86.083–24(b)(1) and if such procedures will involve testing of durability-data vehicles selected by the Administrator or elected by the manufacturer under § 86.083–24(c)(1) prior to initiation of such testing.

(e) The Aministrator does not approve the test procedures for establishing the evaporative emission deterioration factors for heavy-duty vehicles. The manufacturer will submit the procedures as required in § 86.083–21(b)(4)(iii) prior to the Administrator's selection of the test fleet under § 86.083–24(b)(3).

(f) *Light-duty vehicles and light-duty trucks only.* When the Administrator selects emission data vehicles for the test fleet, he will at the same time determine those vehicle or engine parameters which will be subject to adjustment during certification and Selective Enforcement Audit testing; the adequacy of the limits, stops, seals, or other means used to inhibit adjustment; and the resulting physically adjustable ranges for each such parameter and notify the manufacturer of his determinations.

(1)(i) The Administrator may determine to be subject to adjustment the idle fuel-air mixture on gasoline-fueled vehicles (carbureted or fuel injected); the choke valve action parameter(s) on carbureted, gasoline-fueled vehicles; or any parameter on any vehicle (Diesel or gasoline-fueled) which is physically capable of being adjusted, may significantly affect emissions, and was not present on vehicles of the same engine family in the previous model year.

(ii) The Administrator may, in addition, determine to be subject to adjustment any other parameter on any vehicle which is physically capable of being adjusted and which may significantly affect emissions. However, the Administrator may do so only if he has previously notified the manufacturer that he might do so and has found, at the time he gave this notice, that the intervening period would be adequate to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance with such period. In no event will this notification be given later than September 1 of the calendar year two years prior to the model year.

(iii) In determining the parameters subject to adjustment the Administrator will consider the likelihood that, for each of the parameters listed in paragraphs (f)(1)(i) and (f)(1)(ii) of this section, settings other than the manufacturer's recommended setting will occur on in-use vehicles. In determining likelihood, the Administrator will consider such factors as, but not limited to, information contained in the preliminary application, surveilance information from similar in-use vehicles, the difficulty and cost of gaining access to an adjustment, damage to the vehicle if an attempt is made to gain such access and the need to replace parts following such attempt, and the effect of settings other than the manufacturer's recommended setting on vehicle performance characteristics including emission characteristics.

(2)(i) The Administrator will determine a parameter to be adequately inaccessible or sealed if:

(A) In the case of an idle mixture screw, the screw is recessed within the carburetor casting and sealed with lead, thermosetting plastic, or an inverted elliptical spacer or sheared off after adjustment at the factory, and the inaccessibility is such that the screw cannot be accessed and/or adjusted with simple tools in one-half or for $20 (1978 dollars) or less.

(B) In the case of a choke bimetal spring, the plate covering the bimetal spring is riveted or welded in place, or held in place with non-reversible screws.

(C) In the case of a parameter which may be adjusted by elongating or bending adjustable members (e.g., the choke vacuum break), any elongation of the adjustable member is limited by design, or in the case of a bendable member, the member is constructed of a material which when bent would return to its original shape after the force is removed (plastic or spring steel materials).

(D) In the case of any parameter, the manufacturer demonstrates that adjusting the parameter to settings other than the manufacturer's recommended setting takes more than one-half hour or costs more than $20 (1978 dollars).

(ii) The Administrator will determine a physical limit or stop to be an adequate restraint on adjustability if:

(A) In the case of a threaded adjustment, the threads are terminated, pinned or crimped so as to prevent additional travel without breakage or need for reparis which take more than one-half hour or cost more than $20 (1978 dollars).

(B) The adjustment is ineffective at the end of the limits of travel regardless of additional forces or torques applied to the adjustment.

(C) The manufacturer demonstrates that travel or rotation limits cannot be exceeded with the use of simple and inexpensive tools (e.g., screwdriver, pliers, open-end or box wrenches) without incurring significant and costly damage to the vehicle or control system or without taking more than one-half hour or costing more than $20 (1978 dollars).

(iii) If manufacturer service manuals or bulletins describe routing procedures for gaining access to a parameter or for removing or exceeding a physical limit, stop, seal or other means used to inhibit adjustment, or if surveillance data indicate that gaining access, removing, or exceeding is likely, paragraphs (f)(2)(i) and (f)(2)(ii) of this section, the Administrator will consider the likelihood that it will be circumvented, removed, or exceeded on in-use vehicles. In determining likelihood the Administrator will consider such factors as, but not limited to, information contained in the preliminary application; surveillance information from similar in-use vehicles; the difficulty and cost of circumventing, removing, or exceeding the limit, stop, seal, or other means; damage to the vehicle if an attempt is made to circumvent, remove, or exceed it and the need to replace parts following such attempt; and the effect of settings beyond the limit, stop, seal, or other means on vehicle performance characteristics other than emission characteristics.

(3) The Administrator shall determine two physical adjustable ranges for each parameter subject to adjustment.

(i)(A) In the case of a parameter determined to be adequately inaccessible or sealed, the Administrator may include within the physically adjustable range applicable to testing under §§ 86.083–23 and 86.083–29 (certification testing) all settings within the production tolerance associated with the nominal setting for that parameter, as specified by the manufacturer in the preliminary application for certification.

(B) In the case of parameters, the Administrator shall include within this range all settings within physical limits or stops determined to be adequate restraints on adjustability. The Administrator may also include the production tolerances on the location of these limits or stops when determining the physically adjustable range.

(ii)(A) In the case of a parameter determined to be adequately inaccessible or sealed, the Administrator shall include within the physically adjustable range applicable to testing under § 86.608 (Selective Enforcement Audit testing) only the actual setting to which the parameter is adjusted during production.

(B) In the case of other parameters, the Administrator shall include within this range all settings within physical limits or stops determined to be adequate restraints on adjustability, as they are actually located and effective on the test vehicle.

(g) If the manufacturer submits the information specified in §86.083–21(b)(1)(ii) in advance of its full preliminary application for certification, the Administrator shall review the information and make the determinations required in paragraph (f) of this section.

(h) Within 30 days following receipt of notification of the Administrator's determinations made under paragraph (f) of this section, the manufacturer may request a hearing on the Administrator's determinations. The request shall be in writing, signed by an authorized representative of the manufacturer, and shall include a statement specifying the manufacturer's objections to the Administrator's determinations, and data in support of such objections. If, after review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with §86.078–6 with respect to such issue.

8. A new § 86.083–23 is proposed and reads as follows:

§ 86.083–23 Required data.

(a) The manufacturer shall perform the tests required by the applicable test procedures, and submit to the Administrator the following information: *Provided, however,* That:

(1) If requested by the manufacturer, the Administrator may waive any requirement of this section for testing of vehicles (or engines) for which emission data are available, or will be made available, under the provisions of § 86.083–29, or

(2) If requested by the manufacturer, the Administrator may waive any requirement of this section for testing of vehicles at zero kilometers of operation.

(b)(1) Exhaust emission durability data on such vehicles (or engines) tested in accordance with applicable test procedures and in such numbers as specified, which will show the performance of the systems installed on or incorporated in the vehicle (or engine) for extended mileage (or extended operation), as well as a record of all pertinent maintenance (all maintenance and servicing for heavy-duty engines) performed on the test vehicles (or test engines). Records of maintenance and servicing of heavy-duty engines performed prior to the zero-hour point do not need to be submitted but must be maintained.

(2) Evaporative emission deterioration factors for each evaporative emission family-evaporative emission control system combination and all test data that are derived from testing described under § 86.083–21(b)(4)(ii) designed and conducted in accordance with good engineering practice to assure that the vehicles covered by a certificate issued under § 86.083–30 will meet the evaporative emission standards in § 86.082–8 or § 86.082–9 as appropriate, for the useful life of the vehicle.

(3) Evaporative emission deterioration factors for each gasoline-fueled heavy-duty vehicle evaporative emission family-evaporative emission control system combination identified in accordance with § 86.083–21(b)(5) and all test data that are derived from testing described under § 86.083–21(b)(4)(iii) designed and conducted in accordance with good engineering practice to assure that the vehicles covered by a certificate issued under § 86.083–30 will meet the evaporative emission standards in § 86.083–10 for the useful life of the vehicle. The test procedures shall include, but need not be limited to, a consideration of the ambient effects of ozone and temperature fluctuations, and the service accumulation effects of vibration, time, and vapor saturation and purge cycling.

(c) Emission data.

(1) *Certification vehicles.* (i) Emission data on such vehicles tested in accordance with the applicable test procedures and in such numbers as specified, which will show their emissions after zero kilometers (zero miles) and 6,436 kilometers (4,000 miles) operation.

(ii) Emission data on those vehicles selected under § 86.083–24(b)(1)(v) and § 86.083–24(b)(1)(vii)(D) and tested in accordance with the applicable test procedures of this subpart and in such numbers as therein specified, which shall be tested at zero kilometers (zero miles) at any altitude, and under high-altitude conditions after 6,436 kilometers (4,000 miles) of operation at any altitude.

(iii) Emission data on those vehicles selected under § 86.083–24(b)(3) and tested in accordance with the applicable procedures of this subpart and in such numbers as therein specified which shall be tested at zero evaporative emission cycles and 100 evaporative emission cycles.

(2) *Certification engines.* Emission data on such engines tested in accordance with applicable emission test procedures and in such numbers as specified, which will show their emissions after 125 hours of operation. A zero-hour test may be performed after the engine has been approved by the Administrator to begin service accumulation.

(d) A statement that the vehicles (or engines) for which certification is requested conform to the requirements in § 86.078–5(b), and that the descriptions of tests performed to ascertain compliance with the general standards in § 86.078–5(b), and the data derived from such tests, are available to the Administrator upon request.

(e)(1) A statement that the test vehicles (or test engines) with respect to which data are submitted to demonstrate compliance with §§ 86.082–8, 86.082–9, 86.083–10, or 86.080–11, as applicable, are in all material respects as described in the manufacturer's application for certification, have been tested in accordance with the applicable test procedures utilizing the fuels and equipment described in the application for certification and that on the basis of such tests the vehicles (or engines) conform to the requirements of this part. If such statements cannot be made with respect to any vehicle (or engine) tested, the vehicle (or engine) shall be identified, and all pertinent data relating thereto shall be supplied to the Administrator. If, on the basis of the data supplied and any additional data as required by the Administrator, the Administrator determines that the test vehicle (or test engine) was not as described in the application for certification or was not tested in accordance with the applicable test procedures utilizing the fuels and equipment as described in the application for certification, the Administrator may make the determination that the vehicle (or engine) does not meet the applicable standards. The provisions of § 86.083–30(b) shall then be followed.

(2) For evaporative emission durability, the statement of compliance with paragraphs (b)(2) or (b)(3) of this section.

9. A new § 86.083–24 is proposed and reads as follows:

§ 86.083–24 Test vehicles and engines.

(a)(1) The vehicles or engines covered by an application for certification will be divided into groupings of engines which are expected to have similar emission characteristics throughout their useful life. Each group of engines with similar emission characteristics shall be defined as a separate engine family.

(2) To be classed in the same engine family, engines must be identical in all the following respects:

(i) The cylinder bore center-to-center dimensions.

(ii) The dimension from the centerline of the crankshaft to the centerline of the camshaft.

(iii) The dimension from the centerline of the crankshaft to the top of the cylinder block head face.

(iv) The cylinder block configuration (air cooled or water cooled; L–6, 90° V–8, etc.).

(v) The location of intake and exhaust valves, (or ports) and the valve (or port) sizes (within a ⅛-inch range on the valve head diameter or within 10 percent on the port area).

(vi) The method of air aspiration.

(vii) The combustion cycle.

(viii) Catalytic converter characteristics; gasoline-fueled vehicles and engines only.

(ix) Thermal reactor characteristics; gasoline-fueled vehicles and engines only.

(3) Engines identical in all the respects listed in paragraph (a)(2) of this section may be further divided into different engine families if the Administrator determines that they may be expected to have different emission characteristics. This determination will be based upon a consideration of the following features of each engine:

(i) The bore and stroke.

(ii) The surface-to-volume ratio of the nominally dimensioned cylinder at the top dead center position.

(iii) The intake manifold induction port size and configuration.

(iv) The exhaust manifold port size and configuration.

(v) The intake and exhaust valve sizes.

(vi) The fuel system.

(vii) The camshaft timing and ignition or injection timing characteristics.

(4) Where engines are of a type which cannot be divided into engine families based upon the criteria listed in paragraphs (a) (2) and (3) of this section, the Administrator will establish families for those engines based upon the features most related to their emission characteristics.

(5) The gasoline-fueled vehicles covered by an application for certification will be divided into groupings which are expected to have similar evaporative emission characteristics throughout their useful life. Each group of vehicles with similar evaporative emission characteristics shall be defined as a separate evaporative emission family.

(6) to be classed in the same evaporative emission family, vehicles must be similar with respect to:

(i) Type of vapor storage device (e.g., canister, air cleaner, crankcase).

(ii) Canister design characteristics.

(iii) Fuel system characteristics.

(7) Where vehicles are of a type which cannot be divided into evaporative emission families based on the criteria listed above, the Administrator will establish families for those vehicles based upon the features most related to their evaporative emission characteristics.

(8) The gasoline-fueled heavy-duty vehicles covered by an application for certification will be divided into groupings of vehicles on the basis of physical features which are expected to have an affect on evaporative emissions. Each group of vehicles with similar features shall be defined as a separate evaporative emission family.

(9) To be classed in the same evaporative emission family, vehicles must be identical with respect to:

(i) Nominal fuel tank capacity, within a 20-gallon range, or within 25 percent whichever is greater.

(ii) Method of fuel/air metering (i.e., carburetion versus fuel injection).

(iii) Carburetor bowl fuel volume, within a 10cc range.

(10) To be classed in the same evaporative emission control system, vehicles must be identical with respect to:

(i) Method of vapor storage.

(ii) Vapor storage material.

(iii) Vapor storage working capacity, within a 20g capacity.

(iv) Method of carburetor bowl venting.

(v) Vapor purge technique (e.g., air cleaner, carburetor venturi, PCV system, etc.).

(11) Where gasoline-fueled heavy-duty vehicles are types which cannot be divided into evaporative emission family-system combinations based on

the criteria listed above, the Administrator will establish evaporative emission family-system combinations for those vehicles based on features most related to their evaporative emission characteristics.

(b) Emission data. (1) *Emission-data vehicles.* Paragraph (b)(1) of this section applies to light-duty vehicles and light-duty truck emission-data vehicles.

(i) Vehicles will be chosen to be operated and tested for emission data based upon the engine family groupings. Within each engine family, the requirements of this paragraph must be met.

(ii) Vehicles for each engine family will be divided into engine displacement-exhaust emission control system combinations as applicable. A projected sales volume will be established for each combination for the model year for which certification is sought. One vehicle of each combination will be selected in order of decreasing projected sales volume until 70 percent of the projected sales of a manufacturer's total production of vehicles of that engine family is represented, or until a maximum of four vehicles is selected. If any single combination represents over 70 percent, then two vehicles of that combination may be selected. The vehicle selected for each combination will be specified by the Administrator as to such features as engine code, transmission type, fuel system, and inertia weight class.

(iii) The Administrator may select a maximum of four additional vehicles within each engine family based upon features indicating that they may have the highest emission levels of the vehicles in that engine family. In selecting these vehicles, the Administrator will consider such features as the emission control system combination, induction system characteristics, ignition system characteristics, fuel system, rated horsepower, rated torque, compression ratio, inertia weight class, transmission options, and axle ratio.

(iv) If the vehicles selected in accordance with paragraphs (b)(1) (ii) and (iii) of this section do not represent each engine-system combination, then one vehicle of each engine-system combination not represented will be selected by the Administrator. The vehicle selected shall be of the engine displacement with the largest projected sales volume of vehicles with the control system combination in the engine family and will be designated by the Administrator as to such features as engine code, transmission type, fuel system, and inertia weight class.

(v) Within an engine family the Administrator may select one additional vehicle for each engine-system combination with which a manufacturer chooses to demonstrate compliance with applicable emission standards at high altitude.

(vi) The Administrator may combine testing requirements for any vehicle selected under paragraph (b)(1)(v) or (b)(1)(vii)(D) of this section with the testing requirements for any similar vehicle in the same engine-system combination selected under paragraph (b)(1) (ii), (iii) or (iv) of this section or any similar vehicle in the same engine-system, evaporative emission family, evaporative emission control system combination selected under paragraph (b)(1)(vii) (A) or (B) of this section. The testing requirements may be combined by the Administrator by requiring a vehicle selected for testing under paragraphs (b)(1) (ii), (iii), (iv), (vii)(A), or (vii)(B) of this section to be modified (if necessary) after mileage accumulation and emission testing for the purpose of demonstrating compliance with § 86.083–23(c)(1)(ii).

(vii) (A) Vehicles of each evaporative emission family will be divided into evaporative emission control systems. One vehicle of each evaporative emission control system within the evaporative emission family will be selected.

(B) The Administrator may select a maximum of four additional vehicles within each evaporative emission family based upon features indicating that they may have the highest evaporative emission levels of vehicles in that family.

(C) The Administrator may determine that the vehicles selected under paragraphs (b)(1)(ii) through (iv) of this section may be used to satisfy the requirements of paragraphs (b)(1)(vii) (A) and (B) of this section.

(D) The Administrator may also select one additional vehicle for each evaporative emission control system within each evaporative family for those vehicles with which the manufacturer chooses to demonstrate compliance with applicable emission standards at high altitude.

(E) Vehicles selected under paragraph (b)(1)(v) of this section may be used to satisfy the requirements of paragraph (b)(1)(vii)(D) of this section.

(2) *Gasoline-fueled heavy-duty emission-data engines.* Paragraph (b)(2) of this section applies to gasoline-fueled heavy-duty engines.

(i) Engines will be chosen to be run for emission data based upon engine family groupings. Within each engine family, the requirements of this paragraph must be met.

(ii) Engines of each engine family will be divided into engine displacement-exhaust emission control system combinations. A projected sales volume will be established for each combination for the applicable model year. One engine of each combination will be selected in order of decreasing projected sales volume until 70 percent of the projected sales of a manufacturer's total production of engines of that family is represented, or until a maximum of four engines is selected. The engines selected for each combination will be specified by the Administrator as to fuel system.

(iii) The Administrator may select a maximum of two additional engines within each engine family based upon features indicating that they may have the highest emission levels of the engines in that engine family. In selecting these engines, the Administrator will consider such features as the exhaust emission control system, induction system characteristics, ignition system characteristics, fuel system, rated horsepower, rated torque, and compression ratio.

(iv) If the engines selected in accordance with paragraphs, (b)(2) (ii) and (iii) of this section do not represent each engine displacement-exhaust emission control system combination, then one engine of each engine displacement-exhaust emission control system combination not represented shall be selected by the Administrator.

(3) *Gasoline-fueled heavy-duty evaporative emission-data vehicles.* Paragraph (b)(3) of this section applies to gasoline-fueled heavy-duty vehicles.

(i) Vehicles will be chosen to be operated and tested for evaporative emission data based upon the evaporative emission family-system groupings.

(ii)(A) Vehicles for each evaporative emission family will be divided into evaporative emission family-system combinations. One vehicle of each evaporative emission control system within the evaporative emission family will be selected.

(B) The Administrator may select a maximum of two (2) additional vehicles within each evaporative emission family. In selecting these vehicles, the Administrator may consider such features as the exhaust emission-evaporative emission control system combination, the cylinder block characteristics (i.e., in line, vee), the method of aspiration, rated horsepower, rated torque, compression ratio, thermal reactor characteristics, catalytic converter characteristics, the total

weight of the engine including carburetor, manifolds, and all engine-driven accessories, inertia weight class, road load power, transmission options, axle ratios, N/V ratios, engine compartment configuration, and engine coolant thermostat setting.

(4) Diesel heavy-duty emission-data engines. Paragraph (b)(4) of this section applies to Diesel heavy-duty emission-data engines.

(i) Engines will be chosen to be run for emission data based upon engine family groupings. Within each engine family, the requirements of this paragraph must be met.

(ii) Engines of each engine family will be divided into groups based upon exhaust emission control system. One engine of each engine-system combination shall be run for smoke emission data and gaseous emission data as prescribed in § 86.083–26(c)(3). Either the complete gaseous emission test or the complete smoke test may be conducted first. Within each combination, the engine that features the highest fuel feed per stroke, primarily at the speed of maximum rated torque and secondarily at rated speed, will usually be selected. If there are military engines with higher fuel rates than other engines in the same engine-system combination, then one military engine shall also be selected. The engine with the highest fuel feed per stroke will usually be selected.

(iii) The Administrator may select a maximum of one additional engine within each engine-system combination based upon features indicating that it may have the highest emission levels of the engines of that combination. In selecting this engine, the Administrator will consider such features as the injection system, fuel system, compression ratio, rated speed, rated horsepower, peak torque speed, and peak torque.

(c) Durability data. (1) *Durability-data vehicles.* Paragraph (c)(1) of this section applies to light-duty vehicle and light-duty truck durability-data vehicles.

(i) A durability-data vehicle will be selected by the Administrator to represent each engine-system combination. The vehicle selected shall be of the engine displacement with the largest projected sales volume of vehicles with that control-system combination in that engine family and will be designated by the Administrator as to transmission type, fuels system, and inertia weight class.

(ii) A manufacturer may elect to operate and test additional vehicles to represent any engine-system combination. The additional vehicles must be of the same engine displacement, transmission type, fuel system, and inertia weight class as the vehicle selected for that engine-system combination in accordance with the provisions of paragraph (c)(1)(i) of this section. Notice of an intent to operate and test additional vehicles shall be given to the Administrator not later than 30 days following notification of the test fleet selection.

(2) *Gasoline-fueled heavy-duty durability-data engines.* Paragraph (c)(2) of this section applies to gasoline-fueled heavy-duty durability-data engines.

(i) A durability-data engine will be selected by the Administrator to represent each engine-system combination. The engine selected shall be of the displacement with the largest projected sales volume of engines with that exhaust emission control system in that engine family and will be designated by the Administrator as to fuel system.

(ii) [Reserved]

(iii) A manufacturer may elect to operate and test additional engines to represent any engine-system combination. The addional engines must be of the same engine displacement and fuel system as the engine selected for that combination in accordance with the provisions of paragraph (c)(2)(i) of this section. Notice of an intent to run additional engines shall be given to the Administrator not later than 30 days following notification of the test fleet selection. Deterioration factors calculated for each engine-system combination shall be applied separately to military and nonmilitary engines within the same engine system combination.

(3) *Diesel heavy-duty durability-data engines.* Paragraph (c)(3) of this section applies to Diesel heavy-duty durability-data engines.

(i) One engine from each engine-system combination shall be tested as prescribed in § 86.083–26(c)(3)(ii). At each test point, either the completed gaseous emission test or the complete smoke test may be conducted first. Within each combination, the engine which features the highest fuel feed per stroke, primarily at rated speed and secondarily at the speed of maximum rated torque, will usually be selected for durability testing. In the case where more than one engine in an engine-system combination has the highest fuel feed per stroke, the engine with the highest maximum rated horsepower will usually be selected for durability testing. If an engine-system combination includes both military and nonmilitary engines, then the nonmilitary engine with the highest maximum rated horsepower will usually be selected for durability testing.

(ii) A manufacturer may elect to operate and test additional engines to represent any engine-system combination. The additional engines must be of the same model and fuel system as the engine selected in accordance with the provisions of paragraph (c)(3)(i) of this section. Notice of an intent to test additional engines shall be given to the Administrator not later than 30 days following notification of the test fleet selection. Deterioration factors calculated for each engine-system combination shall be applied separately to military and nonmilitary engines within the same engine-system combination.

(d) For purposes of testing under § 86.083–26(a)(9), (b)(9) or (c)(11), the Administrator may require additional emission-data vehicles (or emission-data engines) and durability-data vehicles (or durability-data engines) identical in all material respects to vehicles (or engines) selected in accordance with paragraphs (b) and (c) of this section: *Provided,* That the number of vehicles selected shall not increase the size of either the emission-data fleet or the durability-data fleet by more than 20 percent or one vehicle, whichever is greater.

(e) Any manufacturer whose projected sales for the model year in which certification is sought is less than

(1) 2,000 gasoline-fueled light-duty vehicles, or

(2) 2,000 Diesel light-duty vehicles, or

(3) 2,000 gasoline-fueled light-duty trucks, or

(4) 2,000 Diesel light-duty trucks, or

(5) 2,000 gasoline-fueled heavy-duty engines, or

(6) 1,000 gasoline-fueled heavy-duty vehicles, or

(7) 2,000 Diesel heavy-duty engines,

may request a reduction in the number of test vehicles (or engines) determined in accordance with the foregoing provisions of this section. The Administrator may agree to such lesser number as he determines would meet the objectives of this procedure.

(f)(1) In lieu of testing an emission-data or durability-data vehcile (or engine) selected under paragrpah (b) or (c) of this section, and submitting data therefor, a manufacturer may, with the prior written approval of the Administrator, submit exhaust emission data and/or fuel evaporative emission data, as applicable on a similar vehicle (or engine) for which certification has previously been obtained or for which all applicable data required under § 86.078–23 has previously been submitted.

(2) In lieu of testing a gasoline-fueled heavy-duty evaporative emission-data vehcile selected under paragraph (b)(3) of this section, and submitting data therefore, a manufacturer may, with prior written approval of the Administrator, demonstrate the equivalence or superiority of the evaporative emission control system of the evaporative emission-data vehicle selected for testing, as compared with the evaporative emission control system of another evaporative emission-data vehicle within the same evaporative emission family also selected for testing, but for whch the testing requirements have been, or wil be fulfilled. This demonstration shall be based upon information and/or data deemed acceptable to the Administrator.

(g)(1) This paragraph applies to light-duty vehicles and light-duty trucks.

(2) Where it is expected that more than 33 percent of the vehicles in an engine family will be equipped with an optional item, the full estimated weight of that item shall be included, if required by the Administrator, in the curb weight computation for each vehicle available with that option in the engine family. Where it is expected that 33 percent or less of the vehicles in an engine family will be equipped with an item of optional equipment, no weight for that item will be added in computing curb weight. In the case of mutually exclusive options, only the weight of the heavier option will be added in computing curb weight. Optional equipment weighing less than 3 pounds per item need not be condsidered.

(3) Where it is expected that more than 33 percent of the vehicles in an engine family will be equipped with an item of optional equipment that can reasonably be expected to influence emissions, than such items of optional equipment shall actually be installed, unless specifically excluded by the Administrator, on all emission-data and durability-data vehciles in the engine family on which the option is intended to be offered in production. Optional equipment that can reasonably be expected to influence emissons are the air conditioner, power steering, power brakes and other items determined by the Administrator.

(4) Optional equipment that can reasonably be expected to influence emissions which is utilized on 33 percent or less of the vehicles in the engine family shall not be installed on any vehcile in that engine family unless specifically required under this section.

10. A new § 86.083–25 is proposed and reads as follows:

§ 86.083–25 Maintenance.

(a) *Light-duty vehicles and light-duty trucks.* Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(1) Scheduled maintenance on the engine, emission control system, and fuel system of durability-data vehicles, selected by the Administrator or elected by the manufacturer under § 86.083–24(c)(1), shall be scheduled for performance during durability testing at the same mileage intervals that will be specified in the manufacturer's maintenance instructions furnished to the ultimate purchaser of the motor vehicle. Such maintenance shall be performed, except as provided in paragraph (a)(5)(iii) of this section, only under the following provisions:

(i) Schedules major engine tuneups to manufacturer's specifications may be performed no more frequently than every 12,500 miles of scheduled driving: *Provided,* That no tuneup may be performed after 45,000 miles of scheduled driving. A scheduled major engine tuneup shall be restricted to paragraph (a)(1)(i) (A) or (B) of this section, and shall be conducted in a manner consistent with service instructions and specifications provided by the manufacturer for use by customer service personnel.

(A) *For gasoline-fueled vehicles,* the following items may be inspected, replaced, cleaned, adjusted, and/or serviced as required:

(*1*) Ignition system.

(*2*) Cold starting enrichment system (includes fast idle speed setting).

(*3*) Curb idle speed and air/fuel mixture.

(*4*) Drive belt tension on engine accessories.

(*5*) Valve lash.

(*6*) Inlet air and exhaust gas control valves.

(*7*) Engine bolt torque.

(*8*) Spark plugs.

(*9*) Fuel filter and air filter.

(*10*) Crankcase emission control system.

(*11*) Fuel evaporative emission control system.

(B) *For Diesel vehicles,* a major engine tuneup shall be restricted to the following:

(*1*) Adjust low idle speed.

(*2*) Adjust valve lash if required.

(*3*) Adjust injector timing.

(*4*) Adjust governor.

(*5*) Clean and service injector tips.

(*6*) Adjust drive belt tension on engine accessories.

(*7*) Check engine bolt torque and tighten as required.

(ii) Change of engine and transmission oil, and change or service of oil filter will be allowed at the same mileage intervals that will be specified in the manufacturer's maintenance instructions.

(iii) Readjustment of the engine idle speed (curb idle and fast idle) may be performed, in addition to adjustment during scheduled major engine tuneups, once during the first 5,000 miles of vehicle operation.

(2)(i) *For gasoline-fueled vehicles,* unscheduled maintenance on the engine, emission control system, and fuel system of durability vehicles may be performed, except as provided in paragraph (a)(5)(i) of this section, only under the following provisions:

(A) Any persistently misfiring spark plug may be replaced, in addition to replacement at scheduled major engine tuneup points.

(B) Readjustment of the engine cold starting enrichment system may be performed if there is a problem of stalling or if there is visible black smoke.

(C) Readjustment of the engine idle-speed (curb idle and fast idle) may be performed, in addition to that performed as scheduled maintenance under paragraph (a)(1) of this section, if the idle speed exceeds the manufacturer's recommended idle speed by 300 r.p.m. or more, or if there is a problem of stalling.

(D) The idle mixture may be reset, other than during scheduled major engine tuneups, only with the advance approval of the Administrator.

(ii) *For Diesel vehicles,* unscheduled maintenance on the engine emission control system, and fuel system of durability-data vehicles may be performed except as provided in paragraph (a)(5)(i) of this section, only under the following provisions:

(A) Injectors may be changed if a persistent misfire is detected.

(B) Readjustment of the engine idle speed (curb idle and fast idle) may be performed in addition to that performed as scheduled maintenance under paragraph (a)(1) of this section, if the idle speed exceeds the manufacturer's recommended idle speed by 300 r.p.m. or more, or if there is a problem of stalling.

(3) An exhaust gas recirculation (EGR) system may be serviced during durability testing only under one of the following provisions:

(i) Manufacturers may schedule service to the EGR system at the scheduled major engine tuneup, if an audible and/or visual signal approved by the Administrator alerts the vehicle operator to the need for EGR system maintenance at each of those mileage points. One additional servicing may also be performed as unscheduled maintenance if there is an overt

indication of malfunction and if the malfunction or repair of the malfunction does not render the test vehicle unrepresentative of vehicles in use.

(ii) Manufacturers may service the EGR system as unscheduled maintenance a maximum of three times during the 50,000 miles if failure of the EGR system activates an audible and/or visual signal approved by the Administrator which alerts the vehicle operator to the need for EGR system maintenance. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test vehicle unrepresentative of vehicles in use.

(iii) Manufacturers may service the EGR system a maximum of three times during the 50,000 miles either at a scheduled major engine tuneup point or as unscheduled maintenance, if an audible and/or visual signal approved by the Administrator alerts the vehicle operator to the need for EGR system maintenance. The signal may be activated either by EGR system failure (unscheduled maintenance) or need for scheduled periodic maintenance. If maintenance is performed, the signal for scheduled periodic maintenance shall be reset. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test vehicle unrepresentative of vehicles in use.

(iv) Manufacturers may schedule service to the EGR system at the scheduled major engine tuneup(s) if failure to perform EGR system maintenance is not likely, as determined by the Administrator, to result in an improvement in vehicle performance. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test vehicle unrepresentative of vehicles in use.

(4) The catalytic converter may be serviced once during 50,000 miles if an audible and/or visual signal approved by the Administrator alerts the vehicle operator to the need for maintenance. The signal may be activated either by component failure or need for maintenance at a scheduled point.

(5) Any other engine, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement on durability-data vehicles shall be performed only with the advance approval of the Administrator.

(i) In the case of unscheduled maintenance, such approval will be given if the Administrator:

(A) Has made a preliminary determination that part failure or system malfunction, or the repair of such failure or malfunction, does not render the vehicle unrepresentative of vehicles in use, and does not require direct access to the combustion chamber, except for spark plug, fuel inection component, or removable prechamber removal or replacement; and

(B) Has made a determination that the need for maintenance or repairs is indicated by an overt indication of malfunction such as persistent misfiring, vehicle stalling, overheating, fluid leakage, loss of oil pressure, or charge indicator warning. For the evaporative emission control system this overt indication may be indicated by such items as fuel odor or fluid leakage.

(ii) Emission measurements may not be used as a means of determining the need for unscheduled maintenance under paragraph (a)(5)(i)(A) of this section.

(iii) Requests for authorization of scheduled maintenance of emission control-related components not specifically authorized to be maintained by these regulations must be made prior to the beginning of durability testing. The Administrator will approve the performance of such maintenance if the manufacturer makes a satisfactory showing that the maintenance will be performed on vehicles in use.

(6) If the Administrator determines that part failure or system malfunction occurrence and/or repair rendered the vehicle unrepresentative of vehicles in use, the vehicle shall not be used as a durability-data vehicle.

(7) Where the Administrator agrees under § 86.083–26 to a mileage accumulation of less than 50,000 miles for durability testing, he may modify the requirements of this paragraph.

(8)(i) Adjustment of engine idle speed on emission-date vehicles may be performed once before the 6,436-kilometer (4,000-mile) test point. Any other engine, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement on emission-data vehicles shall be performed only with the advance approval of the Administrator.

(ii) Maintenance on emission-data vehicles selected under §§ 86.083–24 (b)(1)(v) or (b)(1)(vi)(D) and permitted to be tested for purposes of § 86.083–23 (b)(1)(ii) under the provisions of § 86.083–24(b)(1)(vi) may be performed in conjunction with emission control system modifications at the 6,436-kilometer (4,000-mile) test point, and shall be performed in accordance with the maintenance instructions to be provided to the ultimate purchaser required under § 86.083–38.

(iii) Maintenance on those emission-data vehicles selected under § 86.083–24(b)(1)(v) which are not capable of being modified in the field for the purpose of complying with emission standards at an altitude other than intended by the origin design may be performed in conjunction with the emission control system modifications at the 6,436-kilometer (4,000-mile) test point, and shall be approved in advance by the Administrator.

(9) Repairs to vehicle components of the durability-data or emission-data vehicle, other than the engine, emission control system, or fuel system, shall be performed only as a result of part failure, vehicle system malfunction, or with the advance approval of the Administrator.

(10) Complete emissions tests (see §§ 86.106 through 86.145) are required, unless waived by the Administrator, before and after any vehicle maintenance which may reasonably be expected to affect emissions. These test data shall be air posted to the Administrator within 24 hours (or delivered within 3 working days), after the tests, along with a complete record of all pertinent maintenance, including a preliminary engineering report of any malfunction diagnosis and the corrective action taken. A complete engineering report will be delivered or air posted to the Administrator within 10 working days after the tests. In addition, all test data and maintenance reports shall be compiled and provided to the Administrator in accordance with § 86.083–23.

(11) The Administrator shall be given the opportunity to verify the existence of an overt indication of part failure and/or vehicle malfunction (e.g., misfiring, stalling, black smoke), or an activation of an audible and/or visual signal, prior to the performance of any maintenance to which such overt indication or signal is relevant under the provisions of this section.

(12) Equipment, instruments, or tools may not be used to identify malfunctioning, maladjusted, or defective engine components unless the same or equivalent equipment, instruments, or tools will be available to dealerships and other service outlets and

(i) Are used in conjunction with scheduled maintenance on such components.

(ii) Are used subsequent to the identification of a vehicle or engine malfunction, as provided in paragraph

(a)(5)(i) of this section for durability-data vehicles or paragraph (a)(8)(i) of this section for emission-data vehicles, or

(iii) Unless specifically authorized by the Administrator.

(b) [Reserved]

(c)(1) Heavy-duty engines and gasoline-fueled heavy-duty vehicles. Paragraph (c) of this section applies to heavy-duty engines and gasoline-fueled heavy-duty vehicles.

(2)(i) The scheduled maintenance described in this section may be performed on a durability-data engine provided the maintenance is requested in the application for certification. Such scheduled maintenance must be specified at the same intervals in the maintenance instructions furnished to the ultimate purchaser of the vehicle in which the engine, represented by the test engine, is installed. (For equivalent dynamometer hours, engine hours, and mileage intervals, see § 86.079–2.) A scheduled major engine servicing shall be restricted to items listed in this subparagraph and shall be conducted in a manner consistent with service instructions and specifications provided by the manufacturer for use by the customer service personnel.

(A) For gasoline-fueled engines, major engines tuneups to manufacturer's specifications may be performed no more frequently than every 375 hours of scheduled dynamometer operation: *Provided,* No tuneups are performed after 1375 hours of scheduled dynamometer operation. The following items may be inspected, replaced, cleaned, adjusted, and/or serviced as required:

(1) Ignition system.

(2) Cold starting enrichment system (includes fast idle speed setting).

(3) Curb idle speed and air/fuel mixture.

(4) Drive belt tension on engine accessories.

(5) Valve lash.

(6) Inlet air and exhaust gas control valves.

(7) Engine bolt torque.

(8) Spark plugs.

(9) Fuel filter and air filter.

(10) Crankcase emission control system.

(11) Fuel evaporative emission control system.

(B) For Diesel engines one major engine servicing to the manufacturer's specifications may be performed prior to 875 hours (±8 hours) of scheduled dynamometer operation. The following items may be inspected, replaced, cleaned, adjusted, and/or serviced as required:

(1) Low idle speed.

(2) Drive belt tension.

(3) Engine bolt torque.

(4) Valve lash.

(5) Injection timing.

(6) Injector assemblies.

(7) Governor settings.

(C) Normal engine servicing such as engine oil change, and oil filter, fuel filter, and air filter cleaning or replacement will be allowed at manufacturer's recommended intervals. If approved in advance by the Administrator, the maintenance for these items may differ from that specified in the manufacturer's maintenance instructions.

(D) Readjustment of the engine low idle speed may be performed once during the first 125 hours of engine operation.

(ii) Unscheduled maintenance may be performed on durability-data engines, except as provided in paragraph (c)(2)(v)(A) of this section, only under the following provisions:

(A) An injector or spark plug may be changed if a persistent misfire is detected.

(B) Readjustment of a gasoline-fueled engine cold-start enrichment system may be performed if there is a problem of stalling or if there is visible black smoke.

(C) Readjustment of the engine idle speed (curb idle and fast idle) may be performed, in addition to that performed as scheduled maintenance under paragraph (c)(2)(i) of this section, if the idle speed exceeds the manufacturer's recommended idle speed by 300 r.p.m. or more, or if there is a problem of stalling.

(D) The idle mixture may be reset, other than during scheduled major engine tuneups, only with the advance approval of the Administrator.

(iii) Any exhaust gas recirculation (EGR) system may be serviced during durability testing only under one of the following provisions:

(A) Manufacturers may schedule service to the EGR system at the scheduled major engine tuneup if an audible and/or visual signal approved by the Administrator alerts the engine operator to the need for EGR system maintenance at the service point. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test engine unrepresentative of engines in use.

(B) Manufacturers may service the EGR system as unscheduled maintenance a maximum of one time during durability testing (1500 hours for gasoline-fuel engines or 1000 hours for Diesel engines) if failure of the EGR system activates an audible and/or visual signal approved by the Administrator which alerts the engine operator to the need for EGR system maintenance. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test engine unrepresentative of engines in use.

(C) Manufacturers may service the EGR system a maximum of three times during durability testing (1500 hours for gasoline-fueled engines or 1000 hours for Diesel engines) either at a scheduled major engine tuneup point or as unscheduled maintenance, if an audible and/or visual signal approved by the Administrator alerts the engine operator to the need for EGR system maintenance. The signal may be activated either by EGR system failure (unscheduled maintenance) or need for scheduled periodic maintenance. If maintenance is perormed, the signal for scheduled perodic maintenance shall be reset. One additional servicing may also be performed as an unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test engine unrepresentative of engines in use.

(D) Manufacturers may schedule service to the EGR system at the scheduled major engine tuneup(s) if failure to perform EGR system maintenance is not likely as determined by the Administrator, to result in an improvement in engine performance. One additional servicing may also be performed as unscheduled maintenance if there is an overt indication of malfunction and if the malfunction or repair of the malfunction does not render the test engine unrepresentative of engines in use.

(iv) The catalytic converter may be serviced once during durability testing (1500 hours for gasoline-fueled engines or 1000 hours for Diesel engines) if an audible and/or visual signal approved by the Administrator alerts the engine operator to the need for maintenance. The signal may be activated either by component failure or need for maintenance at a scheduled point.

(v) Any other engine, emission control system, or fuel system adjustment, repair, removal, disassembly, cleaning, or replacement on durability-data engines shall be performed only with the advance approval of the Administrator.

(A) In the case of unscheduled maintenance such approval will be given if the Administrtor:

(1) Has made a preliminary determination that part failure or system

malfunction, or the repair of such failure or malfunction, does not render the engine unrepresentative of engines in use, and does not require direct access to the combustion chamber, except for spark plug, fuel injection component, or removable prechamber removal or replacement; and,

(2) Has made a determination that the need for maintenance or repairs is indicated by an overt indication of malfunction such as persistent misfiring, engine stalling, overheating, fluid leakage, loss of oil pressure, excessive fuel consumption or excessive power loss.

(B) Emission measurements may not be used as a means of determining the need for unscheduled maintenance under paragraph (c)(2)(v)(A)(1) of this section.

(C) Requests for authorization of scheduled maintenance of emission control related components not specifically authorized to be maintained by these regulations must be made prior to the beginning of durability testing. The Administrator will approve the performance of such maintenance if the manufacturer makes a satisfactory showing that the maintenance will be performed on engines in use.

(vi) If the Administrator determines that part failure or system malfunction occurrence and/or repair rendered the engine unrepresentative of engines in use, the engine shall not be used as a durability-data engine.

(3)(i) Scheduled maintenance on emission-data engines or gasoline-fueled heavy-duty evaporative emission-data vehicles is limited to the adjustment of idle speed once before the 125-hour test point or the 100 evaporative emission cycles test point, respectively provided the idle speed is outside the manufacturer's specifications.

(ii) Any other engine, emission control system, or fuel system, adjustment, repair, removal, disassembly , cleaning, servicing, or replacement shall be performed only with the advance approval of the Administrator.

(iii) The idle speed reset and any scheduled maintenance on the emission-data engine or gasoline-fueled heavy-duty evaporative emission-data vehicle shall be performed prior to the 125-hour test or the 100 evaporative emission cycles test, respectively. The before-maintenance and after-maintenance tests associated with idle speed reset and scheduled maintenance on the emission-data engine or evaporative emission-data vehicle are waived.

(4) [Reserved]

(5)(i) Complete emission tests (see Subparts D or H of this part for gasoline-fueled engines and Subparts D and I, or I and J of this part for Diesel engines) are required, unless waived by the Administrator, before and after:

(A) Scheduled maintenance approved for durability-data engines, except maintenance performed under § 86.038–25(c)(2)(i)(C);

(B) Unscheduled maintenance which may reasonably be expected to affect emissions.

(ii) The tests before and after scheduled maintenance, which are performed on durability-data engines prior to 117 hours, are waived. The test before scheduled maintenance, which is performed on durability-data engines after 117 hours and prior to 133 hours, is waived. The after-maintenance test must be run and the results used in the deterioration factor calculation in accordance with § 86.083–28.

(iii) The idle speed reset and any scheduled maintenance on the emission-data engine shall be performed prior to the 125-hour test. The before-maintenance and after-maintenance tests associated with idle speed reset and scheduled maintenance on the emission-data engine are waived.

(iv) Test data required by this paragraph shall be air posted to the Administrator within 72 hours of test completion (or delivered within 5 working days), along with a complete record of all pertinent maintenance.

(v) When unscheduled maintenance is approved, a preliminary engineering report, unless waived by the Administrator, shall be air posted within 72 hours (or delivered within 5 working days). A final engineering report shall be delivered or air posted within 10 working days after the completion of the emission tests. The Administrator may approve an extension of the time requirements for the final engineering report.

(vi) All test data, maintenance reports, and required engineering reports shall be compiled and provided to the Administrator in accordance with § 86.083–23.

(6) The Administrator shall be given the opportunity to verify the existence of an overt indication of part failure and/or engine malfunction (e.g., misfiring, stalling.)

(7) Equipment, instruments, or tools may not be used to identify malfunctioning, maladjusted, or defective engine components unless the same or equivalent equipment, instruments, or tools will be available to dealerships and other service outlets, and:

(i) Are used in conjunction with scheduled maintenance on such components;

(ii) Are used subsequent to the identification of an engine or vehicle failure or malfunction, as provided in paragraph (c)(2)(v)(A) of this section for durability-data engines or paragraph (c)(3) of this section for emission-data engines or evaporative emission data vehicles, or

(iii) Unless specifically authorized by the Administrator.

11. A new § 86.083–26 is proposed and reads as follows:

§ 86.083–26 Mileage and service accumulation; emission measurements.

(a)(1) Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(2) The procedure for mileage accumulation will be the Durability Driving Schedule as specified in Appendix IV to this part. A modified procedure may also be used if approved in advance by the Administrator. Except with the advance approval of the Administrator, all vehicles will accumulate mileage at a measured curb weight which is within 100 pounds of the estimated curb weight. If the loaded vehicle weight is within 100 pounds of being included in the next higher inertia weight class as specified in § 86.125, the manufacturer may elect to conduct the respective emission tests at higher loaded vehicle weight. Mileage will be accumulated on four wheel drive vehicles in their normal on-highway mode of operation.

(3) *Emission-data vehicles.*—(i) *Gasoline-fueled.* (A) Each gasoline-fueled emission-data vehicle shall be driven 4,000 miles with all emission control systems installed and operating. Complete exhaust emission tests shall be conducted at zero miles and 4,000 miles on those vehicles selected under § 86.083–24 (b)(1)(ii) through (b)(1)(v). Complete exhaust and evaporative emission tests shall be conducted at zero miles and 4,000 miles on those vehicles selected under § 86.083–24(b)(1)(vii). The manufacturer may at his option test the vehicles selected under § 86.083–29(b)(1)(vii) up to three times at the 4,000-mile test point as long as the ±250-mile test tolerance is adhered to. The Administrator may determine under § 86.083–24(f) that no testing is required.

(B) The emission-data vehicle(s) selected for testing under § 86.083–24 (b)(1)(v) or (b)(1)(vii)(D) shall be driven 6,436 kilometers (4,000 miles) at any altitude. Emission tests shall be conducted at zero kilometers (zero miles at any altitude and 6,436 kilometers (4,000 miles) under high altitude conditions.

(C) The emission-data vehicle(s) selected for testing under § 86.083–24 (b)(1)(v) or (b)(1)(vii)(D) and permitted to be tested for purposes of § 86.083–23(b)(1)(ii) under the provisions of § 86.083–24(b)(1)(vi) shall be driven 6,436 kilometers (4,000 miles) at low altitude. Emission tests shall be conducted at zero kilometers (zero miles) at low altitude and 6,436 kilometers (4,000 miles) under both low- and high-altitude conditions. For the purposes of this subparagraph, "low altitude" means any elevation less than 549 meters (1,800 feet).

(ii) *Diesel.* (A) Each Diesel emission-data vehicle shall be driven 6,436 kilometers (4,000 miles) with all emission control systems installed and operating. Emission tests shall be conducted at zero kilometers (zero miles) and 6,436 kilometers (4,000 miles).

(B) The emission-data vehicle(s) selected for testing under § 86.083–24(b)(1)(v) shall be driven 6,436 kilometers (4,000 miles) at any altitude. Emission tests shall be conducted at zero kilometers (zero miles) at any altitude and 6,436 kilometers (4,000 miles) under high altitude conditions.

(C) The emission-data vehicle(s) selected for testing under § 86.083–24(b)(1)(v) and permitted to be tested for purposes of § 86.083–23(b)(1)(ii) under the provisions of § 86.083–24(b)(1)(vi) shall be driven 6,436 kilometers (4,000 miles) at low altitude. Emission tests shall be conducted at zero kilometers (zero miles) at low altitude and 6,436 kilometers (4,000 miles) under both low- and high-altitude conditions. For the purpose of this subparagraph, "low altitude" means any elevation less than 549 meters (1,800 feet).

(4) *Durability-data vehicles.*—(i) *Gasoline-fueled.* Each gasoline-fueled durability-data vehicle selected by the Administrator or elected by the manufacturer under § 86.083–24(c)(1) shall be driven, with all emission control systems installed and operating, for 50,000 miles or such lesser distance as the Administrator may agree to as meeting the objective of this procedure. Complete exhaust emission tests shall be made on all durability-data vehicles selected by the Administrator or elected by the manufacturer under § 86.083–24(c) at the following mileage points: 0; 5,000; 10,000; 15,000; 20,000; 25,000; 30,000; 35,000; 40,000; 45,000; 50,000. The Administrator may determine under § 86.083–24(f) that no testing is required.

(ii) *Diesel.* Each diesel durability-data vehicle shall be driven with all emission control systems installed and operating, for 50,000 miles or such lesser distance as the Administrator may agree to as meeting the objective of this procedure. Complete emission tests (see §§ 86.106 through 86.145) shall be made at the following mileage points: 0; 5,000; 10,000; 15,000; 20,000; 25,000; 30,000; 35,000; 40,000; 45,000; 50,000.

(5) All tests required by this subpart to be conducted after every 5,000 miles of driving for durability-data vehicles and 4,000 miles for emission-data vehicles must be conducted at any accumulated mileage within 250 miles of each of those test points.

(6)(i) The results of each emission test shall be supplied to the Administrator immediately after the test. The manufacturer shall furnish to the Administrator explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the explanation given by the manufacturer for the voided test. If a manufacturer conducts multiple tests at any test point at which the data are intended to be used in the calculation of the deterioration factor, the number of tests must be the same at each point and may not exceed three valid tests. Tests between test points may be conducted as required by the Administrator. Data from all tests (including voided tests) shall be air posted to the Administrator within 24 hours (or delivered within 3 working days). In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.083–23. Where the Administrator conducts a test on a durability-data vehicle at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(ii) The results of all emission tests shall be rounded, using the "Rounding Off Method" specified in ASTM E29–67, to the number of places to the right of the decimal point indicated by expressing the applicable emission standards of this subpart to three significant figures.

(7) Whenever the manufacturer proposes to operate and test a vehicle which may be used for emission or durability data, he shall provide the zero-mile test data to the Administrator and make the vehicle available for such testing under § 86.083–29 as the Administrator may require before beginning to accumulate mileage on the vehicle. Failure to comply with this requirement will invalidate all test data submitted for this vehicle.

(8) Once a manufacturer begins to operate an emission-data or durability-data vehicle, as indicated by compliance with paragraph (a)(7) of this section, he shall continue to run the vehicle to 4,000 miles or 50,000 miles, respectively, and the data from the vehicle will be used in the calculations under § 86.083–28. Discontinuation of a vehicle shall be allowed only with the written consent of the Administrator.

(9)(i) The Administrator may elect to operate and test any test vehicle during all or any part of the mileage accumulation and testing procedure. In such cases, the manufacturer shall provide the vehicle(s) to the Administrator with all information necessary to conduct this testing.

(ii) The test procedures in §§ 86.106 through 86.145 will be followed by the Administrator. The Administrator will test the vehicles at each test point. Maintenance may be performed by the manufacturer under such conditions as the Administrator may prescribe.

(iii) The data developed by the Administrator for the engine-system combination shall be combined with any applicable data supplied by the manufacturer on other vehicles of that combination to determine the applicable deterioration factors for the combination. In the case of a significant discrepancy between data developed by the Administrator and that submitted by the manufacturer, the Administrator's data shall be used in the determination of deterioration factors.

(10) Emission testing of any type with respect to any certification vehicle other than that specified in this part is not allowed except as such testing may be specifically authorized by the Administrator.

(11) This section does not apply to testing conducted to meet the requirements of § 86.083–23(b)(2).

(b)(1) Paragraph (b) of this section applies to heavy-duty engines and gasoline-fueled heavy-duty vehicles.

(2)(i) For gasoline-fueled engines, the dynamometer service accumulation schedule will consist of several operating conditions which give the percent loads and the modes as specified in the following charts. The percentage of time in each mode must be held within the limits specified. The maximum observed torque for each mode in the service accumulation cycle must be determined at the rpm at which the mode is being conducted. The percent load for that mode will be determined from the maximum torque at the rpm at which the mode is being conducted.

Mode	Observed torque (percent of maximum observed)	Percentage of time
Idle	Idle	23 (22 to 24).
CT	CT	14 (13 to 15).
PTD	10	6 (5 to 7).
Cruise	25	(30 to 32)
PTA	55	15 (14 to 16).
FL	90	11 (10 to 12).

(ii) The equivalent control parameter for engine loading will be manifold vacuum, manifold pressure, or torque. Usage of one of the three parameters will require approval in advance by the Administrator. The control parameter values that correspond to the appropriate percent loads as specified in the emission test cycle will be initially determined at the zero-hour point or after an appropriate break-in procedure. The control parameter values determined initially will be used for the entire service accumulation schedule. If at any time during the service accumulation, the 90 percent torque value cannot be attained, the engine shall be operated at wide-open throttle.

(iii) The average sped shall be between 1,650 and 1,700 rpm. Subject to the requirements as to average speed, there must be operation at speeds in excess of 3,200 rpm (but not in excess of governed speed for governed engines or rated speed for non-governed engines) for a cumulative maximum of 0.5 percent of the actual cycle time, excluding time in transient conditions. Maximum cycle time shall be 15 minutes. A cycle approved in advance by the Administrator shall be used.

(3)(i) For Diesel engines, the following criteria must be met before service accumulation can begin. Failure to comply with these requirements shall invalidate all test data submitted for an engine.

(A) Each engine shall produce at least 95 percent of the maximum horsepower, corrected to rating conditions, at 95 to 100 percent of the rated speed.

(B) The fuel rate at maximum horsepower shall be within manufacturer's specifications.

(ii) During service accumulation, hours can be credited toward the required service accumulation hours when the following criteria are met. If these criteria cannot be met, engine operation shall be discontinued and the Administrator shall be notified immediately. (Adjustments to the fuel rate can be approved under the provisions of § 86.083–25.)

(A) Each engine shall produce at least 95 percent of the maximum horsepower, at 95 to 100 percent of the rated speed, observed at the zero-hour point. Horsepower values shall be corrected to the rating conditions.

(B) The engines shall be operated at 75 percent of the inlet and exhaust restrictions specified in § 86.079–8 except that the tolerance will be ±3 inches of water and ±0.5 inch of Hg respectively.

(C) During each emission test the inlet and exhaust restrictions shall be as specified in § 86.079–8.

(4) If a break-in procedure is used the procedure must be the same as recommended to the ultimate purchaser. Prior approval by the Administrator is require for use of any break-in procedure. The hours accumulated during the break-in procedure will not be counted as part of the service accumulation.

(5)(i) Emission-data engines: Each emission-data engine shall be operated for 125 hours with all emission control systems installed and operating. An emission may be performed after the engine has been approved by the Administrator to begin service accumulation. Evaporative emission controls need not be connected provided normal conditions are maintained in the engine induction system.

(ii) Gasoline-fueled heavy-duty evaporative emission-data vehicles: The evaporative emission control system components of each evaporative emission-data vehicle shall undergo 100 evaporative emission cycles as defined in Heavy-Duty Vehicle Evaporative Emission Control System Service Accumulation Schedule as specified in Appendix XII to this subpart. A minimum of the last 10 evaporative emission cycles shall be accumulated with the evaporative emission-data vehicle. A modified procedure may be used if approved in advance by the Administrator.

(6) Durability-data engines: Each gasoline-fueled durability-data engine shall be operated, with all emission control systems installed and operating, for 1,500 hours. Each Diesel durability-data engine shall be operated for 1,000 hours. Emission measurement, as prescribed, shall be made at 125-hour intervals beginning 125 hours of operation. A zero-hour emission test may be performed after the engine has been approved by the Administrator to begin service accumulation. Evaporative emission controls need not be connected provided normal operating conditions are maintained in the engine induction system.

(7) All tests required by this subpart to be conducted after 125 hours of operation or at any multiple of 125 hours may be conducted at any accumulated number of hours within 8 hours of 125 hours or the appropriate multiple of 125 hours respectively.

(8)(i) Data from all emission tests (including voided tests) shall be air posted to the Administrator within 72 hours (or delivered within 5 working days). The manufacturer shall furnish to the Administrator an explanation for voiding any test. The Administrator will determine if voiding the test was appropriate based upon the explanation given by the manufacturer for the voided test. If a manufacturer conducts multiple tests at any test point at which the data are intended to be used in the calculation of the deterioration factor, the number of tests must be the same at each point and may not exceed 3 valid tests. Tests between test points may be conducted as required by the Administrator. In addition, all test data shall be compiled and provided to the Administrator in accordance with § 86.083–23. Where the Administrator conducts a test on a durability-data engine at a prescribed test point, the results of that test will be used in the calculation of the deterioration factor.

(ii) The results of all emission tests shall be recorded and reported to the Administrator using two places to the right of the decimal point. These numbers shall be rounded in accordance with the "Rounding Off Method" specified in ASTM E 29–67.

(9) Whenever the manufacturer proposes to operate and test an engine or evaporative emission-data vehicle which may be used for emission or durability data, he shall provide such information concerning components used on the engine or evaporative emission-data vehicle as the Administrator may require and make the engine or evaporative emission-data vehicle available for such testing under § 86.083–29 as the Administrator may require, before beginning to accumulate hours or evaporative emission cycles on the engine or evaporative emission-data vehicle. Failure to comply with this requirement will invalidate all test data later submitted for this engine or vehicle.

(10) Once a manufacturer begins to operate an emission-data or durability-data engine or evaporative emission-data vehicle, as indicated by compliance with paragraph (b)(9) of this section, he shall continue to run any emission-data engine to 125 hours, or any evaporative emission-data vehicle to 100 evaporative emission cycles, or any gasoline-fueled durability-data engine to 1,500 hours, and any diesel durability-data engine to 1,000 hours. The data from the engine will be used in the calculations under § 86.345. The data from the evaporative emission-data vehicle will be used in the calculations under § 86.1243–82. Discontinuation of an engine or evaporative emission-data vehicle, shall be allowed only with the prior written consent of the Administrator.

(11)(i) The Administrator may elect to operate and test any test engine or evaporative emission-data vehicle during all or any part of the service accumulation and testing procedure. In such cases the manufacturer shall

provide the engine(s) or evaporative emission-data vehicle(s) to the Administrator with all information necessary to conduct the testing.

(ii) The test procedures (Subparts D or H of this part for gasoline-fueled engines, Subpart M of this part for gasoline-fueled heavy-duty vehicles, and Subparts D, I, or J of this part of diesel engines) will be followed by the Administrator. The Administrator will test the engines or vehicles, as applicable, at each test point. Maintenance may be performed by the manufacturer under such conditions as the Administrator may prescribe.

(iii) The data developed by the Administrator for the engine-system combination shall be combined with any applicable data supplied by the manufacturer on other engines of that combination to determine the applicable deterioration factors for the combination. In the case of a significant discrepancy between data developed by the Administrator and that submitted by the manufacturer, the Administrator's data shall be used in the determination of deterioration factors.

(12) Emission testing of any type with respect to any certification engine or evaporative emission-data vehicle other than that specified in this subpart is not allowed except as such testing may be specifically authorized by the Administrator.

12. A new § 86.083–27 is proposed and reads as follows:

§ 86.083–27 Special test procedures.

(a) For light-duty vehicles, light-duty trucks and gasoline-fueled heavy-duty vehicles the Administrator may, on the basis of a written application therefore by a manufacturer, prescribe test procedures, other than those set forth in this part, for any motor vehicle which he determines is not susceptible to satisfactory testing by the procedures set forth herein or in Subpart B or M of this part.

(b) For heavy-duty engines:

(1) The Administrator, may on the basis of a written application therefore by a manufacturer, prescribe test procedures, other than those set forth in this subpart, for any motor-vehicle engine which he determines is not susceptible to satisfactory testing by the procedures set forth herein or in Subparts D and I of this part.

(2) If the manufacturer does not submit a written application for use of special test procedures but the Administrator determines that a motor-vehicle engine is not susceptible to satisfactory testing by the procedures set forth herein, the Administrator will reject the applicable portions of the application. The Administrator shall notify the manufacturer in writing and set forth the reasons for such rejection in accordance with the provisions of § 86.083–22(c).

13. A new § 86.083–28 is proposed and reads as follows:

§ 86.083–28 Compliance with emission standards.

(a)(1) Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(2) The applicable exhaust and fuel evaporative emission standards of this subpart apply to the emissions of vehicles for their useful life.

(3) Since it is expected that emission control efficiency will change with mileage accumulation on the vehicle, the emission level of a vehicle which has accumulated 50,000 miles will be used as the basis for determining compliance with the standards.

(4) The procedure for determining compliance of a new motor vehicle with exhaust emission standards is as follows:

(i) Separate emission deterioration factors shall be determined from the exhaust emission results of the durability-data vehicle(s) for each engine-system combination. A separate factor shall be established for exhaust HC, exhaust CO, exhaust NOx, and exhaust particulate (diesel vehicles only) for each engine-system combination. A separate evaporative emission deterioration factor shall be determined for each evaporative emission family-evaporative emission control system combination from the testing conducted by the manufacturer (gasoline-fueled vehicles only).

(A) The applicable results to be used in determining the exhaust emission deterioration factors for each engine-system combination shall be:

(*1*) All valid exhaust emission data from the test required under § 86.083–26(a)(4) except the zero-mile tests. This shall include the official test results, as determined in § 86.083–29 for all tests conducted on all durability-data vehicles of the combination selected under § 86.083–24(c) (including all vehicles elected to be operated by the manufacturer under § 86.083–24(c)(1)(ii)).

(*2*) All exhaust emission data from tests conducted before and after the scheduled maintenance provided in § 86.083–25.

(*3*) All exhaust emission data from tests required by maintenance approved under § 86.083–25, in those cases where the Administrator conditioned his approval for the performance of such maintenance on the inclusion of such data in the deterioration factor calculation.

(B) All applicable exhaust emission results shall be plotted as a function of the mileage on the system, rounded to the nearest mile, and the best fit straight lines, fitted by the method of least squares, shall be drawn through all these data points. The interpolated 4,000- and 50,000-mile points on this line must be within the standards provided in § 86.078–8 or § 86.079–9, as applicable, or the data will not be acceptable for use in calculation of a dterioration factor, unless no applicable data point exceeded the standard. An exhaust emission deterioration factor shall be calculated for each engine system combination as follows:

Factor = Exhaust emissions interpolated to 50,000 miles ÷ exhaust emissions interpolated to 4,000 miles.

These interpolated values shall be carried out to a minimum of four places to the right of the decimal point before dividing one by the other to determine the deterioration factor. The results shall be rounded to three places to the right of the decimal point in accordance with ASTM E 29–67.

(C) An evaporative emissions deterioration factor shall be determined from the testing conducted as described in § 86.083–21(b)(4)(ii), for each evaporative emission family evaporative emission control system combination to indicate the evaporative emission level at 50,000 miles relative to the evaporative emission level at 4,000 miles as follows:

Factor = Evaporative emission level at 50,000 miles minus the evaporative emission level at 4,000 miles.

The factor shall be established to a minimum of two places to the right of the decimal.

(ii)(A) The official exhaust emission test results for each emission-data vehicle at the 4,00-mile test point shall be multiplied by the appropriate deterioration factor: *Provided,* That if a deterioration factor as computed in paragraph (a)(4)(i)(B) of this section is less than one, that deterioration factor shall be one for the purposes of this paragraph.

(B) The official evaporative emission test results for each evaporative emission-data vehicle at the 4,00-mile test point shall be adjusted by addition of the appropriate deterioration factor: *Provided,* That if a deterioration factor as computed in paragraph (a)(4)(i)(C) of this section is less than zero, that deterioration factor shall be zero for the purposes of this paragraph.

(iii) The emissions to compare with the standard shall be the adjusted

emissions of paragraph (a) (4) (ii)(A) and (B) of this section for each emission-data vehicle. Before any emission value is compared with the standard, it shall be rounded, in accordance with ASTM E 29–67, to two significant figures. The rounded emission values may not exceed the standard.

(iv) Every test vehicle of an engine family must comply with the exhaust emission standards, as determined in paragraph (a)(4)(iii) of this section, before any vehicles that family may be certified.

(v) Every test vehicle of an evaporative emission family must comply with the evaporative emission standards, as determined in paragraph (a)(4)(iii) of this section, before any vehicle in that family may be certified.

(b)(1) Paragraph (b) of this section applies to heavy-duty engines.

(2) The exhaust emission standards for gasoline-fueled engines in § 86.083–10 or for Diesel engines in § 86.079–11 apply to the emissions of engines for their useful life.

(3) Since emission control efficiency decreases with the accumulation of hours on the engine, the emission level of a gasoline-fueled engine which has accumulated 1,500 hours of dynamometer operation or a diesel engine which has accumulated 1,000 hours of dynamometer operation will be used as the basis for determining compliance with the standards.

(4) The procedure for determining compliance of a new engine with exhaust emission standards is as follows:

(i) Separate emission deterioration factors shall be determined from the emission results of the durability-data engines for each engine-system combination. Separate factores shall be established for HC, CO, and for the combined emissions of HC and NO_x. For Diesel engines, separate factors shall also be established for the acceleration mode (designated as "A"), the lugging mode (designated as "B") and the peak opacity (designated as "C").

(A) The applicable results to be used in determining the deterioration factors for each combination shall be:

(*1*) All valid emission data from the tests required under § 86.083–26(b). These shall include the official test results, as determined in § 86.083–29, for all tests conducted on all gasoline-fueled durability-data engines of the combination selected under § 86.083–24(c)(2) or on all diesel durability-data engines of the combination selected under § 86.083–24(c)(3) (including all engines elected to be operated by the manufacturer under § 86.083–24(c)(2)(iii) for gasoline-fueled engines or under § 86.083–24(c)(3)(ii) for diesel engines).

(*2*) All emission data from the tests conducted before and after maintenance provided in § 86.083–25(c)(2)(i)(A) for gasoline-fueled engines or in § 86.083–25(c)(2)(i)(B) for diesel engines.

(*3*) All emission data from the tests conducted before and after maintenance provided in § 86.083–25(c)(2)(v)(C) for diesel engines if emission tests were conducted.

(B) All applicable emission results for (1) HC, (2), CO, (3), HC + NO_x, (4) acceleration smoke ("A"), (5) lugging smoke ("B"), and (6) peak smoke ("C") shall be plotted as a function of durability hours which shall be consistently rounded to the nearest hour. Emission data shall have two figures to the right of the decimal. The best fit straight lines, fitted by the method of least squares, shall be drawn through these data points. The interpolated 125-hour and 1,500-hour points for gasoline-fueled engines or the 1,000-hour point for Diesel engines on each line, rounded to whole numbers in accordance with ASTM E 29–67, must be within the standards specified in § 86.083–10 for gasoline-fueled engines or in § 86.079–11 for Diesel engines or the data shall not be used in the calculation of a deterioration factor, unless no applicable data points exceed the standards.

(C) The interpolated values shall be used to calculate a deterioration factor as follows:

Factor = Exhaust emissions interpolated to 1,500 hours for gasoline-fueled engines or to 1,000 hours for Diesel engines minus the exhaust emissions interpolated to 125 hours. (Negative deterioration factors shall be considered zero.)

(ii) The appropriate deterioration factor, carried out to two places to the right of the decimal point, shall be added to the exhaust emission test results, carried out to two places to the right of the decimal point, for each emission-data engine.

(iii) The emission values to compare with the standards shall be the adjusted emission values of paragraph (b)(4)(ii) of the section rounded to two significant figures in accordance with ASTM E 29–67 for each emission-data engine.

(iv) Every test engine of engine family must comply with all applicable standards, as determined in paragraph (b)(4)(iii) of this section, before any engine in that family will be certified.

(c)(1) Paragraph (c) of this section applies to gasoline-fueled heavy-duty vehicles.

(2) The applicable fuel evaporative emission standard in § 86.083–10 applies to the emissions of vehicles for their useful life.

(3) Because it is expected that emission control efficiency will change during the useful life of the vehicle, an evaporative emission deterioration factor shall be determined from the testing described in § 86.083–21(b)(4)(iii), for each evaporative emission family-evaporative emission control system combination to indicate the evaporative emission control system deterioration during the useful life of the vehicle (minimum 50,000 miles). The factor shall be established to a minimum of two places to the right of the decimal.

(4) The official evaporative emission results for each evaporative emission-data vehicle at the 100 cycle test point shall be adjusted by the addition of the appropriate deterioration factor: *Provided,* that if the deterioration factor as computed in paragraph (c)(3) of this section is less than zero, that deterioration factor shall be zero for the purposes of this paragraph.

(5) The emission level to compare with the standard shall be the adjusted emission level of paragraph (c)(4) of this section for each emission-data vehicle. Before any emission value is compared with the standard, it shall be rounded, in accordance with ASTME 29–67, to two significant figures. The rounded emission values may not exceed the standard.

(6) Every test vehicle of an evaporative emission family must comply with the evaporative emission standard, as determined in paragraph (c)(5) of this section, before any vehicle in that family may be certified.

14. A new § 86.083–29 is proposed and reads as follows:

§ 86.083–29 Testing by the Administrator.

(a)(1) Paragraph (a) of this section applies to light-duty vehicles and light-duty trucks.

(2) The Administrator may require that any one or more of the test vehicles be submitted to him, at such place or places as he may designate, for the purposes of conducting emissions tests. The Administrator may specify that he will conduct such testing at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be sheduled by the manufacturer as promptly as possible.

(3)(i) Whenever the Administrator conducts a test on a test vehicle, the results of that test shall, unless subsequently invalidated by the Administrator, comprise the official data

for the vehicle at the prescibed test point and the manufacturer's data for that prescribed test point shall not be used in determining compliance with emission standards.

(ii) Whenever the Administrator does not conduct a test on a test vehicle at a test point, the manufacturer's test data will be accepted as the official data for that test point: *Provided,* That if the Administrator makes a determination based on testing under paragraph (a)(2) of this section, that there is a lack of correlation between the manufacturer's test equipment and the test equipment used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by the manufacturer: *And further provided,* That if the Administrator has reasonable basis to believe that any test data submitted by the manufacturer is not accurate or has been obtained in violation of any provisions of this part, the Administrator may refuse to accept that data as the official data pending retesting or submission or further information. If the manufacturer conducts more than one test on a vehicle, as authorized under § 86.083–26(a)(3)(i)(A), the data from the last test in that series of tests on that vehicle, will constitute the official data:

(iii)(A)(*1*) The Administrator may adjust or cause to be adjusted any adjustable parameter of an emission data vehicle or engine which the Administrator has determined to be subject to adjustment for certification and Selective Enforcement Audit testing in accordance with § 86.083–22(e)(1), to any setting within the physically adjustable range of that parameter, as determined by the Administrator in accordance with § 86.083–22(e)(3)(i), prior to the performance of any tests to determine whether such vehicle or engine conforms to applicable emission standards, including tests performed by the manufacturer under § 86.083–23(c)(1). However, if the idle speed parameter is one which the Administrator has determined to be subject to adjustment, the Administrator shall not adjust it to a setting which causes a higher engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter on the vehicle before it accumulated any mileage, all other parameters being adjusted identically for the purpose of comparison. The Administrator, in making or specifying such adjustments, will consider the effect of the deviation from the manufacturer's recommended setting on emissions performance characteristics as well as the likelihood that similar settings will occur on in-use light-duty vehicles or light-duty trucks. In determining likelihood, the Administrator will consider factors such as, but not limited to, the effect of the adjustment on vehicle performance characteristics and surveillance information from similar in-use vehicles.

(*2*) For those vehicles or engine parameters which the Administrator has not determined to be subject to adjustment during certification and Selective Enforcement Audit testing in accordance with § 86.083–22(e)(1), the emission-data vehicle presented to the Administrator for testing shall be calibrated within the production tolerances applicable to the manufacturer's specifications to be shown on the vehicle label (see § 86.083–35(a)(1)(iii)(D)) as specified in the application for certification. If the Administrator determines that a vehicle is not within such tolerances, the vehicle will be adjusted, at the facility designated by the Administrator, prior to the test and an engineering report shall be submitted to the Administrator describing the corrective action taken. Based on the engineering report, the Administrator will determine if the vehicle will be used as an emission-data vehicle.

(B) If the Administrator determines that the test data developed on an emission-data vehicle under paragraph (a)(3)(i) of this section would cause that vehicle to fail due to excessive 4,000 mile emissions or by application of the appropriate deterioration factor, then the following procedure shall be observed:

(*1*) The manufacturer may request a retest. Before the retest, those vehicle or engine parameters which the Administrator has not determined to be subject to adjustment for certification and Selective Enforcement Audit testing in accordance with § 86.083–22(e)(1) may be readjusted to manufacturer's specifications, if these adjustments were made incorrectly prior to the first test. The Administrator may adjust or cause to be adjusted any parameter which the Administrator has determined to be subject to adjustment to any setting within the physically adjustable range of that parameter, as determined by the Administrator in accordance with § 86.083–22(e)(3)(i). However, if the idle speed parameter is one which the Administrator has determined to be subject to adjustment, the Administrator shall not adjust it to a setting which causes a higher engine idle speed than would have been possible within the physically adjustable range of the idle speed parameter on the vehicle before it accumulated any mileage, all other parameters being adjusted identically for the purpose of comparison. Other maintenance or repairs may be performed in accordance with § 86.083–25. All work on the vehicle shall be done at such location and under such conditions as the Administrator may prescribe.

(*2*) The vehicle will be retested by the Administrator and the results of this test shall comprise the official data for the emission-data vehicle.

(iv) If sufficient durability data are not available at the time of any emission test conducted under paragraph (a)(2) of this section to enable the Administrator to determine whether an emission-data vehicle would fail, the manufacturer may request a retest in accordance with the provisions of paragraphs (a)(3)(iii)(A) and (B) of this section. If the manufacturer does not promptly make such request, he shall be deemed to have waived the right to a retest. A request for retest must be made before the manufacturer removes the vehicle from the test premises.

(b)(1) Paragraph (b) of this section applies to heavy-duty engines and gasoline-fueled heavy-duty vehicles.

(2) The Administrator may require that any one or more of the test engines or test vehicles be submitted to him, at such place or places as he may designate, for the purpose of conducting emissions tests. The Administrator may specify that he will conduct such testing at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. Any testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(3)(i) Whenever the Administrator conducts a test on a test engine or test vehicle the results of that test, unless subsequently invalidated by the Administrator, shall comprise the official data for the engine or vehicle at that prescribed test point and the manufacturer's data for that prescribed test point shall not be used in determining compliance with emission standards.

(ii) Whenever the Administrator does not conduct a test on a test engine or test vehicle at a test point, the manufacturer's test data will be accepted as the official data for that test point: *Provided,* That if the Administrator makes a determination based on testing under paragraph (b)(2) of this section, that there is a lack of

correlation between the manufacturer's test equipment and the test equipment used by the Administrator, no manufacturer's test data will be accepted for purposes of certification until the reasons for the lack of correlation are determined and the validity of the data is established by the manufacturer: *And further provided,* That if the Administrator has reasonable basis to believe that any test data submitted by the manufacturer is not accurate or has been obtained in violation of any provision of this part, the Administrator may refuse to accept that data as the official data pending retesting or submission of further information.

(iii)(A) The emission-data engine or evaporative emission-data vehicle presented to the Administrator for testing shall be calibrated with the production tolerances applicable to the manufacturer's specifications to be shown on the engine label (see § 86.083–35(a)(2)(iii) as specified in the application for certification. If the Administrator determines that an engine or evaporative emission-data vehicle is not within such tolerances, the engine or evaporative emission-data vehicle shall be adjusted at the facility designated by the Administrator prior to the test and an engineering report shall be submitted to the Administrator describing the corrective action taken. Based on the engineering report the Administrator will determine if the engine or vehicle shall be used as an emission-data engine or evaporative emission-data vehicle.

(B) If the Administrator determines that the test data developed under paragraph (b)(3)(iii)(A) of the section would cause the emission-data engine to fail due to excessive 125-hour emission values or by the application of the deterioration factor, or would cause the evaporative emission-data vehicle to fail due to excessive 100 evaporative emission cycles emission values or by the application of the appropriate deterioration factor, then the following procedure shall be observed.

(1) The manufacturer may request a retest. Before the retest, the engine or evaporative emission-data vehicle may be readjusted to the manufacturer's specifications if these adjustments were made incorrectly prior to the first test, and other maintenance or repairs may be performed in accordance with § 86.083–25. All work on the engine or evaporative emission-data vehicle shall be done at such location and under such conditions as the Administrator may prescribe.

(2) The engine or evaporative emission-data vehicle will be retested by the Administrator and the results of this test shall comprise the official data for the emission-data engine or evaporative emission-data vehicle.

(iv) If sufficient durability-data are not available at the time of any emission test conducted under paragraph (b)(2) of this section to enable the Administrator to determine whether an emission-data engine or evaporative emission-data vehicle would fail, the manufacturer may request a retest in accordance with the provisions of paragraphs (b)(3)(iii)(B)(1) and (2) of this section. If the manufacturer does not promptly make such request, he shall be deemed to have waived the right to a retest. A request for retest must be made before the manufacturer removes the engine or evaporative emission-data vehicle from the test premises.

15. A new § 86.083–30 is proposed and reads as follows:

§ 86.083–30 Certification.

(a)(1) If, after a review of the test reports and data submitted by the manufacturer, data derived from any inspection carried out under § 86.078–7(c) and any other pertinent data or information, the Administrator determines that a test vehicle(s) (or test engine(s)) meets the requirements of the Act and of this subpart, he will issue a certificate of conformity with respect to such vehicle(s) (or engine(s)) except in cases covered by paragraph (c) of this section.

(i) Each certificate of conformity shall state the altitude(s) at which the vehicle(s) covered by the certificate has demonstrated compliance with the applicable emission standards.

(2) Such certificate will be issued for such period not to exceed one model year as the Administrator may determine and upon such terms as he may deem necessary to assure that any new motor vehicle (or new motor vehicle engine) covered by the certificate will meet the requirements of the Act and of this part. Each such certificate shall contain the following language:

This certificate covers only those new motor vehicles (or new motor vehicle engines) which conform, in all material respects, to the design specifications that applied to those vehicles (or engines) described in the application for certification and which are produced during the—model year production period of the said manufacturer, as defined in 40 CFR 86.078–2.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 86.078–7(c) which concern either the vehicle (or engine) certified, or any production vehicle (or production engine) covered by this certificate, or any production vehicle (or production engine) which when completed will be claimed to be covered by this certificate. Failure to comply with all the requirements of § 86.078–7(c) with respect to any such vehicle (or engine) may lead to revocation or suspension of this cetificate as specified in 40 CFR 86.078–30(c). It is also a term of this certificate that this certificate may be revoked or suspended for the other reasons stated in § 86.078–30 (c) or (d).

(3) One certificate will be issued for each engine family and for each gasoline-fueled heavy-duty vehicle evaporative-emission family and will certify compliance with no more than one set of applicable standards except that for gasoline-fueled light-duty vehicles and light-duty trucks, one such certificate will be issued for each engine family-evaporative emission family combination and will certify compliance with no more than one set of applicable standards.

(4) [Reserved]

(5) The counties identified below have substantially all of their area located above 1,219 meters (4,000 ft.):

Counties Located Substantially Above 1,219 Meters (4,000 Feet) in Elevation

State of Arizona

Apache, Navajo

State of Colorado

Adams, Alamosa, Arapahoe, Archuleta, Boulder, Chaffee, Clear Creek, Conejos, Costilla, Crowley, Custer, Dolores, Delta, Denver, Douglas, Eagle, Elbert, El Paso, Fremont, Garfield, Gilpin, Grand, Gunnison, Hinsdale, Huerfano, Jackson, Jefferson, Lake, La Plata, Larimer, Las Animas, Lincoln, Mesa, Mineral, Moffat, Montezuma, Montrose, Morgan, Ouray, Park, Pitkin, Pueblo, Rio Blanco, Rio Grande, Routt, Saguache, San Juan, San Miguel, Summit, Teller, Washington, Weld.

State of Idaho

Bannock, Bear Lake, Bingham, Blaine, Bonneville, Butte, Camas, Caribou, Cassia, Clark, Custer, Franklin, Fremont, Jefferson, Madison, Minidoka, Oneida, Power, Teton, Valley.

State of Montana

Beaverhead, Deer Lodge, Gallatin, Jefferson, Madison, Meagher, Park, Silver Bow.

State of Nebraska

Banner, Kimball, Sioux.

State of Nevada

Carson City, Douglas, Elko, Esmeralda, Eureka, Humboldt, Lander, Lyon, Mineral, Storey, White Pine.

State of New Mexico

Bernalillo, Catron, Colfax, Curry, DeBaca, Grant, Guadalupe, Harding, Lincoln, Los Alamos, Luna, McKinley, Mora, Rio Arriba, Sandoval, San Juan, San Miguel, Sante Fe, Sierra, Socorro, Taos, Torrance, Union, Valencia.

State of Oregon

Lake.

State of Utah

Beaver, Box Elder, Cache, Carbon, Daggett, Davis, Duchesne, Emery, Grand, Iron, Juab, Kane, Millard, Morgan, Piute, Rich, Salt Lake, San Juan, Sanpete, Sevier, Summit, Tooele, Uintah, Utah, Wasatch, Wayne, Weber.

State of Wyoming

Albany, Carbon, Converse, Fremont, Goshen, Hot Springs, Johnson, Laramie, Lincoln, Natrona, Niobrara, Park, Platte, Sublette, Sweetwater, Teton, Uinta, Weston.

(6) [Reserved]

(7) Certificates issued for light-duty vehicles or light-duty trucks certified with catalytic converters shall be subject to the following term in addition to the term in paragraph (a)(2) of this section: "Catalyst-equipped vehicles, otherwise covered by this certificate, which are driven outside the United States, Canada, and Mexico will be presumed to have been operated on leaded gasoline resulting in deactivation of the catalysts. If these vehicles are imported or offered for importation without retrofit of the catalyst, they will be considered not to be within the coverage of this certificate unless included in a catalyst control program operated by a manufacturer or a United States Government Agency and approved by the Administrator."

(8) Certificates issued for incomplete light-duty trucks shall be subject to the following term in addition to the term in paragraph (a)(2) of this section: "For incomplete light-duty trucks, this certificate covers only those new motor vehicles which when completed by having the primary load-carrying device or container attached, conform to the maximum curb weight and frontal area limitations described in the application for certification as required in 40 CFR 86.079–21(d)."

(9)(i) Certificates issued for incomplete gasoline-fueled heavy-duty vehicles shall be subject to the following term in addition to the term in paragraph (a)(2) of this section:

For incomplete heavy-duty vehicles, this certificate covers only those new motor vehicles which when completed by having the primary load-carrying device or container attached, conforms to the maximum completed gross vehicle weight and maximum completed frontal area limitations described in the application for certification as required in 40 CFR § 86.083–21(d) and are not removed from inclusion in the evaporative emission control family—evaporative emission control system combinations described in the application for certification.

(ii) Certificates issued for heavy-duty engines shall be subject to the following term in addition to the term in paragraph (a)(2) of this section: "For heavy-duty engines, this certificate covers only those new motor vehicle engines installed in heavy-duty vehicles which conform to the minimum gross vehicle weight rating, curb weight, or frontal area limitations for heavy-duty vehicles described in 40 CFR 86.079–2."

(b)(1) The Administrator will determine whether a vehicle (or engine) covered by the application complies with applicable standards by observing the following relationships:

(i) *Light-duty vehicles and light-duty trucks.* (A) The durability-data vehicle(s) selected under § 86.083–24(c)(1)(i) shall represent all vehicles of the same engine-system combination.

(B) The emission-data vehicle(s) selected under § 86.083–24(b)(1)(ii), (b)(1)(iii), and (b)(1)(iv) shall represent all vehicles of the same engine-system combination as applicable to be sold below 4,000 feet.

(C) The emission-data vehicle(s) selected under § 86.083–24(b)(1)(vii)(A) and (b)(1)(vii)(B) shall represent all vehicles of the same evaporative control system within the evaporative family, as applicable, to be sold below 4000 ft.

(D) The emission-data vehicle(s) selected under § 86.083–24(b)(1)(v) shall represent all vehicles of the same engine-system combination to be sold at high altitude.

(E) The emission-data vehicle(s) selected under § 86.083–24(b)(1)(vii)(D) shall represent all vehicles of the same evaporative control system within the evaporative family sold at high altitude.

(ii) *Gasoline-fueled heavy-duty engines.* (A) A test engine selected under § 86.083–24(b)(2)(ii) and (iv) shall represent all engines in the same engine family of the same engine displacement-exhaust emission control system combination.

(B) A test engine selected under § 86.083–24(b)(2)(iii) shall represent all engines in the same engine family of the same engine displacement-exhaust emission control system combination.

(C) A test engine selected under § 86.083–24(c)(2)(i) shall represent all engines of the same engine-system combination.

(iii) *Gasoline-fueled heavy-duty vehicles.* The test vehicle selected under § 86.083–24(b)(3)(ii)(A) and (b)(3)(ii)(B) shall represent all vehicles of the same evaporative-emission control system within the evaporative emission family, as applicable.

(iv) *Diesel heavy-duty engines.* (A) A test engine selected under § 86.083–24(b)(3)(ii) shall represent all engines in the same engine-system combination.

(B) A test engine selected under § 86.083–24(b)(3)(iii) shall represent all engines of that emission control system at the rated fuel delivery of the test engine.

(C) A test engine selected under § 86.083–24(c)(3)(i) shall represent all engines of the same engine-system combination.

(2) The Administrator will proceed as in paragraph (a) of this section with respect to the vehicles (or engines) belonging to an engine family or engine family-evaporative emission family combination (as applicable), all of which comply with all applicable standards.

(3) If, after a review of the test reports and data submitted by the manufacturer, data derived from any additional testing conducted pursuant to § 86.083–29, data or information derived from any inspection carried out under § 86.078–7(c) or any other pertinent data or information, the Administrator determines that one or more test vehicles (or test engines) of the certification test fleet do not meet applicable standards, he will notify the manufacturer in writing, setting forth the basis for his determination. Within 30 days following receipt of the notification, the manufacturer may request a hearing on the Administrator's determination. The request shall be in writing, signed by an authorized representative of the manufacturer and shall include a statement specifying the manufacturer's objections to the Administrator's determination and data in support of such objections. If, after a review of the request and supporting data, the Administrator finds that the request raises a substantial factual issue, he shall provide the manufacturer a hearing in accordance with § 86.078–6 with respect to such issue.

(4) For light-duty vehicles and light-duty trucks the manufacturer may, at his option, proceed with any of the following alternatives with respect to an emission-data vehicle determined not in compliance with all applicable standards for which it was tested:

(i) Request a hearing under § 86.078–6; or

(ii) Remove the vehicle configuration (or evaporative vehicle configuration, as applicable) which failed, from his application;

(A) If the failed vehicle was tested for compliance with exhaust emission standards only: The Administrator may select, in place of the failed vehicle, in accordance with the selection criteria employed in selecting the failed vehicle, a new emission-data vehicle to be tested for exhaust emission compliance only.

(B) If the failed vehicle was tested for compliance with both exhaust and

evaporative emission standards: The Administrator may select, in place of the failed vehicle, in accordance with the selection criteria employed in selecting the failed vehicle, a new emission-data vehicle which will be tested for compliance with both exhaust and evaporative emission standards. If one vehicle cannot be selected in accordance with the selection criteria employed in selecting the failed vehicle, then two vehicles may be selected (i.e., one vehicle to satisfy the exhaust emission vehicle selection criteria and one vehicle to satisfy the evaporative emission vehicle selection criteria). The vehicle selected to satisfy the exhaust emission vehicle selection criteria will be tested for compliance with exhaust emission standards only. The vehicle selected to satisfy the evaporative emission vehicle selection criteria will be tested for compliance with both exhaust and evaporative emissions standards; or

(iii) Remove the vehicle configuration (or evaporative vehicle configuration, as applicable) which failed from his application and add a vehicle configuration(s) (or evaporative vehicle configuration(s), as applicable) not previously listed. The Administrator may require, if applicable, that the failed vehicle be modified to the new engine code (or evaporative emission code, as applicable) and demonstrate by testing that it meets applicable standards for which it was originally tested. In addition, the Administrator may select, in accordance with the vehicle selection criteria given in § 86.083–24(b), a new emission-data vehicle or vehicles. The vehicles selected to satisfy the exhaust emission vehicle selection criteria will be tested for compliance with exhaust emission standards only. The vehicles selected to satisfy the evaporative emission vehicle selection criteria will be tested for compliance with both exhaust and evaporative emission standards; or

(iv) Correct a component or system malfunction and show that with a correctly functioning system or component the failed vehicle meets applicable standards for which it was originally tested. The Administrator may require a new emission-data vehicle, of identical vehicle configuration (or evaporative vehicle configuration as applicable) to the failed vehicle, to be operated and tested for compliance with the applicable standards for which the failed vehicle was originally tested.

(5) For heavy-duty engines and gasoline-fueled heavy-duty vehicles, the manufacturer may, at his option, proceed with any of the following alternatives with respect to any engine family or any gasoline-fueled heavy-duty evaporative emission family represented by a test engine(s) or vehicle(s) determined not in compliance with applicable standards:

(i) Request a hearing under § 86.078–6; or

(ii) Delete from the application for certification the engines represented by the failing test engine. (Engines so deleted may be included in a later request for certification under § 86.083–32.) The Administrator will then select in place of each failing engine an alternate engine chosen in accordance with selection criteria employed in selecting the engine that failed; or

(iii) Modify the test engine and demonstrate by testing that it meets applicable standards. Another engine which is in all material respects the same as the first engine, as modified, shall then be operated and tested in accordance with applicable test procedures.

(6) If the manufacturer does not request a hearing or present the required data under paragraphs (b)(4) or (b)(5) (as applicable) of this section, the Administrator will deny certification.

(c)(1) Notwithstanding the fact that any certification vehicle(s) (or certification engine(s)) may comply with other provisions of this subpart, the Administrator may withhold or deny the issuance of a certificate of conformity (or suspend or revoke any such certificate which has been issued) with respect to any such vehicle(s) (or engine(s)) if:

(i) The manufacturer submits false or incomplete information in his application for certification thereof;

(ii) The manufacturer renders inaccurate any test data which he submits pertaining thereto.

(iii) Any EPA Enforcement Officer is denied access on the terms specified in § 86.078–7(c) to any facility or portion thereof which contains any of the following:

(A) The vehicle (or engine);

(B) Any components used or considered for use in its modification or build up into a certification vehicle (or certification engine);

(C) Any production vehicle (or production engine) which is or will be claimed by the manufacturer to be covered by the certificate;

(D) Any step in the construction of a vehicle (or engine) described in (C) of this subdivision;

(E) Any records, documents, reports, or histories required by this part to be kept concerning any of the above.

(iv) Any EPA Enforcement Officer is denied "reasonable assistance" (as defined in § 86.078–7(c)) in examining any of the items listed in paragraph (c)(1)(iii) of this section.

(2) The sanctions of withholding, denying, revoking, or suspending of a certificate may be imposed for the reasons in paragraphs (c)(1)(i), (ii), (iii), or (iv) of this section only when the infraction is substantial.

(3) In any case in which a manufacturer knowingly submits false or inaccurate information or knowingly renders inaccurate or invalid any test data or commits any other fraudulent acts and such acts contribute substantially to the Administrator's decision to issue a certificate of conformity, the Administrator may deem such certificate void ab initio.

(4) In any case in which certification of a vehicle (or engine) is proposed to be withheld, denied, revoked, or suspended under paragraph (c)(1)(iii), or (c)(1)(iv) of this section, and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.078–7 (c) in fact occurred, the manufacturer, if he wished to contend that, even though the violation occurred, the vehicle (or engine) in question was not involved in the violation to a degree that would warrant withholding denial, revocation, or suspension of certification under either paragraph (c)(1)(iii) or (c)(1)(iv) of this section, shall have the burden of establishing that contention to the satisfaction of the Administrator.

(5) Any revocation or suspension of certification under paragraph (c)(1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.078–6 hereof.

(ii) Extend no further than to forbid the introduction into commerce of vehicles (or engines) previously covered by certification which are still in the hands of the manufacturer, except in cases of such fraud or other misconduct as makes certification invalid ab initio.

(6) The manufacturer may request in the form and manner specified in paragraph (b)(3) of this section that any determination made by the Administrator under paragraph (c)(1) of this section to withhold or deny certification be reviewed in a hearing conducted in accordance with § 86.078–6. If the Administrator finds, after a review of the request and supporting data, that the request raises a substantial factual issue he will grant the request with respect to such issue.

(d)(1) *For light-duty vehicles and light-duty trucks.* Notwithstanding the fact that any vehicle configuration or

engine family may be covered by a valid outstanding certificate of conformity, the Administrator may suspend such outstanding certificate of conformity in whole or in part with respect to such vehicle configuration or engine family if:

(i) The manufacturer refuses to comply with the provisions of a test order issued by the Administrator pursuant to § 86.603; or

(ii) The manufacturer refuses to comply with any of the requirements of § 86.603; or

(iii) The manufacturer submits false or incomplete information in any report or information provided pursuant to the requirements of § 86.609; or

(iv) The manufacturer renders inaccurate any test data which he submits pursuant to § 86.609; or

(v) Any EPA Enforcement Officer is denied access to a facility on the terms specified in § 86.606.

(vi) Any EPA Enforcement Officer is denied the opportunity on the terms specified in § 86.606 to

(A) Monitor vehicle selection pursuant to § 86.607,

(B) Select vehicles for testing pursuant to § 86.607, or

(C) Monitor vehicle testing performed to satisfy any of the requirements of this part; or

(vii) Any EPA Enforcement Officer is denied "reasonable assistance" as defined in § 86.606 in examining any of the items listed in that section; or

(viii) The manufacturer refuses to comply with the requirements of §§ 86.604 (a), 86.605, 86.607, 86.608, 86.610, or 86.611.

(2) The sanction of suspending a certificate may not be imposed for the reasons in paragraphs (d)(1)(i), (ii) or (viii) of this section where such refusal is caused by conditions and circumstances outside the control of the manufacturer which renders it impossible to comply with those requirements. Such conditions and circumstances shall include, but are not limited to, any uncontrollable factors which result in the temporary unavailability of equipment and personnel needed to conduct the required tests, such as equipment breakdown or failure or illness of personnel, but shall not include failure of the manufacturer to adequately plan for and provide the equipment and personnel needed to conduct the tests. The manufacturer will bear the burden of establishing the presence of the conditions and circumstances required by this paragraph.

(3) The sanctions of suspending a certificate may be imposed for the reasons in paragraphs (d)(1)(iii), (iv), (v), (vi), (vii) of this section only when the infraction is substantial.

(4) In any case in which a manufacturer knowingly submitted false or inaccurate information or knowingly rendered inaccurate any test data or committed any other fraudulent acts, and such acts contributed substantially to the Administrator's original decision not to suspend or revoke a certificate of conformity in whole or in part, the Administrator may deem such certificate void from the date of such fraudulent act.

(5) In any case in which certification of a vehicle is proposed to be suspended under paragraph (d)(1)(v), (d)(1)(vi), or (d)(1)(vii) of this section, and in which the Administrator has presented to the manufacturer involved reasonable evidence that a violation of § 86.606 in fact occurred, the manufacturer, if he wishes to contend that, even though the violation occurred, the vehicle configuration or engine family in question was not involved in the violation to a degree that would warrant suspension of certification under either paragraph (d)(1)(v), (d)(1)(vi), or (d)(1)(vii) of this section, shall have the burden of establishing that contention to the satisfaction of the Administrator.

(6) Any suspension of certification under paragraph (d)(1) of this section shall:

(i) Be made only after the manufacturer concerned has been offered an opportunity for a hearing conducted in accordance with § 86.613 hereof and

(ii) Not apply to vehicles no longer in the hands of the manufacturer.

16. A new § 86.083–32 is proposed and reads as follows:

§ 86.083–32 Addition of a vehicle or engine after certification.

(a) If a manufacturer proposes to add to his product line a vehicle (or engine) of the same engine-system combination as vehicles (or engines) previously certified but which was not described in the application for certification when the test vehicle(s) (or test engine(s)) representing other vehicles (or engines) of that combination was certified, he shall notify the Administrator. Such notification shall be in advance of the addition unless the manufacturer elects to follow the procedure described in § 86.083–34. This notification shall include a full description of the vehicle (or engine) to be added.

(b) The Administrator may require the manufacturer to perform such tests on the test vehicle(s) (or test engine(s)) representing the vehicle (or engine) to be added which would have been required if the vehicle (or engine) had been included in the original application for certification.

(c) If, after a review of the test reports and data submitted by the manufacturer, and data derived from any testing conducted under § 86.083–29, the Administrator determines that the test vehicle(s) or test engine(s) meets all applicable standards, the appropriate certificate will be amended accordingly. If the Administrator determines that the test vehicle(s) (or test engine(s)) does not meet applicable standards, he will proceed under § 86.083–30(b).

17. A new § 86.083–33 is proposed and reads as follows:

§ 86.083–33 Changes to a vehicle or engine covered by certification.

(a) The manufacturer shall notify the Administrator of any change in production vehicles (or production engines) in respect to any of the parameters listed in § 86.083–24(a)(3), § 86.083–24(b)(1)(iii), § 86.983–24(b)(2)(iii), § 86.083–24(b)(3)(iii), or § 86.083–24(b)(4)(iii) as applicable, giving a full description of the change. Such notification shall be in advance of the change unless the manufacturer elects to follow the procedure described in § 86.083.34.

(b) Based upon the description of the change, and data derived from such testing as the Administrator may require or conduct, the Administrator will determine whether the vehicle (or engine), as modified, would still be covered by the certificate of conformity then in effect.

(c) If the Administrator determines that the outstanding certificate would cover the modified vehicles (or engines) he will notify the manufacturer in writing. Except as provided in § 86.083–34, the change may not be put into effect prior to the manufacturer's receiving this notification. If the Administrator determines that the modified vehicles (or engines) would not be covered by the certificates then in effect, the modified vehicles (or engines) shall be treated as additions to the product line subject to § 86.083.32.

18. A new § 86.083–34 is proposed and reads as follows:

§ 86.083–34 Alternative procedure for notification of additions and changes.

(a) A manufacturer may, in lieu of notifying the Administrator in advance of an addition of a vehicle (or engine) under § 86.083–32 or a change in a vehicle (or engine) under § 86.083–33, notify him concurrently with the making of the change if the manufacturer believes the addition or change will not require any testing under the appropriate section. Upon notification to

the Administrator, the manufacturer may proceed to put the addition or change into effect.

(b) The manufacturer may continue to produce vehicles (or engines) as described in the notification to the Administrator for a maximum of 30 days unless the Administrator grants an extension in writing. This period may be shortened by a notification in accordance with paragraph (c) of this section.

(c) If the Administrator determines, based upon a description of the addition or change, that no test data will be required, he will notify the manufacturer in writing of the acceptability of the addition or change. If the Administrator determines that test data will be required, he will notify the manufacturer to rescind the change within 5 days of receipt of the notification. The Administrator will then proceed as in § 86.083–32 (b) and (c), or § 86.083–33 (b) and (c) as appropriate.

(d) Election to produce vehicles (or engines) under this section will be deemed to be a consent to recall all vehicles (or engines) which the Administrator determines under § 86.083–32(c) do not meet applicable standards and to cause such noncomformity to be remedied at no expense to the owner.

19. A new § 86.983–35 is proposed and reads as follows:

§ 86.083–35 Labeling.

(a) The manufacturer of any motor vehicle (or motor vehicle engine) subject to the applicable emission standards of this subpart, shall, at the time of manufacture, affix a permanent legible label, of the type and in the manner described below, containing the information hereinafter provided, to all production models of such vehicles (or engines) available for sale to the public and covered by a certificate of conformity under § 86.083–30(a).

(1) *Light-duty vehicles and light-duty trucks.*—(i) *A permanent, legible label shall be affixed in a readily visible position in the engine compartment.*

(ii) The label shall be affixed by the vehicle manufacturer who has been issued the certificate of conformity for such vehicle, in such a manner that it cannot be removed without destroying or defacing the label. The label shall not be affixed to any equipment which is easily detached from such vehicle.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals, which shall be of a color that contrasts with the background of the label:

(A) The label heading: Vehicle Emission Control Information;

(B) Full corporate name and trademark of the manufacturer;

(C) Engine displacement (in cubic inches), engine, family identification and evaporative family identification;

(D) Engine tuneup specifications and adjustments, as recommended by the manufacturer to the ultimate purchaser, including but not limited to idle speed(s), ignition timing, the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), high idle speed, initial injection timing, and valve lash (as applicable) as well as other parameters deemed necessary by the manufacturer. These specifications should indicate the proper transmission position during tuneup and what accessories (e.g., air-conditioner), if any, should be in operation. If a manufacturer provides tuneup specifications and adjustments for his vehicle for operation at an altitude other than that at which compliance was demonstrated, e.g., adjustments for operation below 1,219 meters for vehicles which demonstrated compliance at elevations above 1,219 meters, the manufacturer may either include these specifications and adjustments on his engine compartment label, or may indicate on the label where these adjustments might be found, i.e., by reference to the owner's manual or shop manual.

(E) An unconditional statement of compliance with the appropriate model year U.S. Environmental Protection Agency regulations which apply to light-duty vehichles or light-duty trucks;

(F) The altitude at which the vehicle has demonstrated compliance with the applicable emission standards as specified by the certificate of conformity issued under § 86.083–30. (An example of an acceptable statement is: "Compliance demonstrated above/below 4,000 feet.")

(2) *Heavy-duty engines.* (i) A permanent legible label shall be affixed to the engine in a position in which it will be readily visible after installation in the vehicle.

(ii) The label shall be attached to an engine part necessary for normal engine operation and not normally requiring replacement during engine life.

(iii) The label shall contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

(A) The label heading: Engine Exhaust Emission Control Information;

(B) Full corporate name and trademark of manufacturer;

(C) Engine displacement (in cubic inches) and engine family and model designations;

(D) Date of engine manufacture (month and year);

(E) Engine specifications and adjustments as recommended by the manufacturer. These specifications should indicate the proper transmission position during tuneup and what accessories (e.g., air conditioner), if any, should be in operation;

(F) For gasoline-fueled engines the label should include the idle speed, ignition timing, and the idle air-fuel mixture setting procedure and value (e.g., idle CO, idle air-fuel ratio, idle speed drop), and valve lash.

(G) For diesel engines the label should include the advertised hp. at rpm, fuel rate at advertised hp. in mm^3/stroke, valve lash, initial injection timing, and idle speed.

(H) An unconditional statement of compliance with the appropriate model year (e.g., 1979) U.S. Environmental Protection Agency regulations applicable to heavy-duty engines.

(iv) The label may be made up of one or more pieces: *Provided,* That all pieces are permanently attached to the same engine or vehicle part as applicable.

(b) The provisions of this section shall not prevent a manufacturer from also reciting on the label that such vehicle (or engine) conforms to any applicable State emission standards for new motor vehicles (or new motor vehicle engines) or any other information that such manufacturer deems necessary for, or useful to, the proper operation and satisfactory maintenance of the vehicle (or engine).

(c)(1) The manufacturer of any light-duty vehicle or light-duty truck subject to the emission standards of this subpart, shall, in addition and subsequent to setting forth those statements on the label required by the Department of Transportation (DOT) pursuant to 49 CFR 567.4, set forth, on the DOT label or on an additional label located in proximity to the DOT label and affixed as described in 49 CFR 567.4(b), the following information in the English language, lettered in block letters and numerals not less than three thirty-seconds of an inch high, of a color that contrasts with the background of the label:

(i) The heading: "Vehicle Emission Control Information";

(ii) The statement: "This Vehicle Conforms to U.S. EPA Regulations Applicable to 1979 Model Year New Motor Vehicles."

(iii) One of the following statements, as applicable, in letters and numerals not less than six thirty-seconds of an

inch high and of a color that contrasts with the background of the label:

(A) For all vehicles certified as noncatalyst-equipped: "NON-CATALYST;"

(B) For all vehicles certified as catalyst-equipped which are included in a manufacturer's catalyst control program for which approval has been given by the Administrator: "CATALYST-APPROVED FOR IMPORT;"

(C) For all vehicles certified as catalyst-equipped which are not included in a manufacturer's catalyst control program for which prior approval has been given by the Administrator: "CATALYST."

(2) In lieu of selecting either of the labeling options of paragraph (c)(1) of this section, the manufacturer may add the information required by paragraph (c)(1)(iii) of this section to the label required by paragraph (a) of this section. The required information will be set forth in the manner prescribed by paragraph (c)(1)(iii) of this section.

(d) Incomplete light-duty trucks or incomplete heavy-duty vehicles optionally certified as light-duty trucks shall have the following statement printed on the label required in paragraph (a)(1) of this section in lieu of the statement required by paragraph (a)(1)(iii)(E) of this section: "This vehicle conforms to U.S. EPA regulations applicable to 19— Model Year New Motor Vehicles when completed at a maximum curb weight of —— pounds and a maxcimum frontal area of —— square feet."

(e) Incomplete heavy-duty vehicles having an 8,500 pound gross vehicle weight rating or less shall have the following statement printed on the label required in paragraph (a)(2) or (a)(3) of this section in lieu of the statement required by paragraph (a)(2)(iii)(F) or (a)(3)(iii)(F) of this section: "This engine conforms to U.S. EPA regulations applicable to 19— Model Year New Heavy-Duty Engines when installed in a vehicle completed at a curb weight of more than 6,000 pounds or with a frontal area greater than 46 square feet."

(f) Incomplete gasoline-fueled heavy-duty vehicles shall have the following statement printed on the label required in paragraph (a)(2) of this section in lieu of the statement required in paragraph (a)(2)(iii) of this section:

"This vehicle conforms to U.S. EPA regulations applicable to 19—— Model Year New Motor Vehicles when completed at a maximum gross vehicle weight of ——— pounds, a maximum frontal area of ——— square feet, a maximum nominal fuel tank capacity of ——— gallons, and an evaporative emission control system of ——— grams working capacity.

(g) The manufacturer of any incomplete vehicle shall notify the purchaser of such vehicle of any curb weight, frontal area, or gross vehicle weight rating limitations affecting the emissions certificate application to that vehicle. This notification shall be transmitted in a manner consistent with the National Highway Traffic Safety Administration safety notification requirements published in 49 CFR Part 568.

20. A new § 86.083–37 is proposed and reads as follows:

§ 86.083–37 Production vehicles and engines.

(a) Any manufacturer obtaining certification under this part shall supply to the Administrator, upon his request, a reasonable number of production vehicles (or engines) selected by the Administrator which are representative of the engines, emission control systems, fuel systems, and transmissions offered and typical of production models available for sale under the certificate. These vehicles (or engines) shall be supplied for testing at such time and place and for such reasonable periods as the Administrator may require. Heavy-duty engines supplied under this paragraph may be required to be mounted in chassis and appropriately equipped for operation on a chassis dynamometer, and may additionally be required to have completed engine compartments and all available fuel tanks appropriately installed on the vehicle to allow for a proper environment for all evaporative emission control system components during any fuel evaporative emission testing.

(b)(1) Any manufacturer of light-duty vehicles or light-duty trucks, obtaining certification under this part shall notify the Administrator on a quarterly basis, of the number of vehicles domestically produced for sale in the United States and the number of vehicles produced and imported for sale in the United States during the preceding quarter. A manufacturer may elect to provide this information every 60 days instead of quarterly, to combine it with the notification required under § 86.078–36. The notification must be submitted 30 days after the close of the reporting period unless, upon petition by the manufacturer, the Administrator finds good cause to waive this requirement and set an alternative reporting date for this report. The vehicle production information required shall be submitted as follows:

(i) Total production volume expressed in terms of units produce.

(ii) Model type production volume, expressed for each model type in terms of units produced and as a percentage of total production.

(iii) Base level production volume, expressed for each model type in terms of units produced and as a percentage of total production.

(iii) Based level production volume, expressed for each base level in terms of units produced and as a percentage of (A) the total production of its respective model type(s) and, (B) total production.

(iv) Vehicle configuration production volume, expressed for each vehicle configuration in terms of units produced, and as a percentage of the total production of its respective base level. In addition, each vehicle configuration shall be identified by its appropriate engine-system combination.

(2) All light-duty vehicles and light-duty trucks covered by a certificate of conformity under § 86.083–30(a) shall be adjusted by the manufacturer to the ignition or injection timing specification detailed in § 86.083–35(a)(1)(iii)(D).

(c) *Heavy-duty engines and vehicles.* Any heavy-duty engine or vehicle manufacturer obtaining certification under this part shall notify the Administrator, on a quarterly basis, of the number of engines or vehicles of each engine family—evaporative emission family—engine displacement-exhaust emission control system-fuel system combination produced for sale in the United States during the preceding quarter.

(d) The following definitions apply to this section:

(1) "Model type" means a unique combination of car line, basic engine, and transmission class.

(2) "Base level" means a unique combination of basic engine, inertia weight, and transmission class.

(3) "Vehicle configuration" means a unique combination of basic engine, engine code, inertia weight, transmission configuration, and axle ratio within a base level.

21. A new § 86.083–38 is proposed and reads as follows:

§ 86.083–38 Maintenance instructions.

(a) The manufacturer shall furnish or cause to be furnished to the purchaser of each new motor vehicle (or motor vehicle engine) subject to the standards prescribed in §§ 86.082–8, 86.082–9, 86.083–10, or 86.079–11, as applicable, written instructions for the maintenance and use of the vehicle (or engine) by the purchaser as may be reasonable and necessary to assure the proper functioning of emission control systems.

(1) Such instructions shall be provided for those vehicle and engine components listed in Appendix VI to this part (and for any other components) to the extent that maintenance of these components is necessary to assure the proper functioning of emission control systems.

(2) Such instructions shall be in clear, and to the extent practicable, nontechnical language.

(b) The maintenance instructions required by this section shall contain a general description of the documentation which the manufacturer will require from the ultimate purchaser or any subsequent purchaser as evidence of compliance with the instructions.

(c) For gasoline-fueled light-duty vehicles and light-duty trucks.

(1) Such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under § 86.083–25(a), and shall explain the conditions under which EGR system and catalytic converter maintenance are to be performed (e.g., what type of warning device is being employed and whether the device is activated by component failure or the need for periodic maintenance).

(2) [Reserved]

(3) [Reserved]

(d) For Diesel light-duty vehicles and light-duty trucks.

(1) Such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under § 86.083–25(a) and shall explain the conditions under which EGR system and catalytic converter maintenance are to be performed (e.g., what type of warning device is being employed and whether the device is activated by component failure or the need for periodic maintenance).

(2) [Reserved]

(e) For gasoline-fueled heavy-duty engines, such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under § 86.083–25(c)(2). Scheduled maintenance in addition to that performed on the durability-data engine under § 86.083–25(d)(2) may be recommended for reasons such as to offset the effects of operating conditions which differ from the dynamometer durability cycle or to increase the life of the engine beyond 1,500 hours (or the equivalent). The instructions may schedule maintenance on a calendar time basis and/or mileage basis in addition to the engine service time basis that was followed by the manufacturer under § 86.083–25(c)(2).

(f) For Diesel heavy-duty engines, such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under § 86.083–25(d)(2). Scheduled maintenance in addition to that performed on the durability-data engine under § 86.083–25(d)(2) may be recommended for reasons such as to offset the effects of operating conditions which differ from the dynamometer durability cycle or to increase the life of the engine beyond 1,000 hours (or the equivalent). The instructions may schedule maintenance on a calendar time basis, mileage basis, engine service time basis, or combinations of each.

(Secs. 202, 206, 301 of the Clean Air Act, as amended (42 U.S.C. §§ 7521, 7525, 7601))

22. A new Subpart M is proposed to read as follows:

Subpart M—Evaporative Emission Test Procedures for New Gasoline-Fueled Heavy-Duty Vehicles

Sec.

86.1201–83 Applicability.
86.1202–83 Definitions.
86.1203–83 Abbreviations.
86.1204 [Reserved]
86.1205–83 Introduction; structure of subpart.
86.1206–83 Equipment required; overview.
86.1207–83 Sampling and analytical system; evaporative emissions.
86.1208 [Reserved]
86.1209 [Reserved]
86.1210 [Reserved]
86.1211 [Reserved]
86.1212 [Reserved]
86.1213–83 Fuel specifications.
86.1214–83 Analytical gases.
86.1215–83 EPA heavy-duty vehicle (HDV) urban dynamometer driving schedule.
86.1216–83 Calibrations; frequency and overview.
86.1217–83 Evaporative emission enclosure calibrations.
86.1218–83 Dynamometer calibration.
86.1219 [Reserved]
86.1220 [Reserved]
86.1221–83 Hydrocarbon analyzer calibration.
86.1222 [Reserved]
86.1223 [Reserved]
86.1224 [Reserved]
86.1225 [Reserved]
86.1226–83 Calibration of other equipment.
86.1227–83 Test procedures; overview.
86.1228–83 Transmissions.
86.1229–83 Dynamometer load determination.
86.1230–83 Test sequence; general requirements.
86.1231–83 Vehicle preparation.
86.1232–83 Vehicle preconditioning.
86.1233–83 Diurnal breathing loss test.
86.1234–83 Running loss test.
86.1235–83 Dynamometer procedure.
86.1236–83 Engine starting and restarting.
86.1237–83 Dynamometer runs.
86.1238–83 Hot soak test.
86.1239 [Reserved]
86.1240 [Reserved]
86.1241 [Reserved]
86.1242–83 Records required.
86.1243–83 Calculations; evaporative emissions.
86.1244 [Reserved]
86.1245 [Reserved]

Authority: Secs. 202, 206, 301, Clean Air Act as amended (42 U.S.C. 7521, 7525, 7601)

Subpart M—Evaporative Emission Test Procedures for New Gasoline-Fueled Heavy-Duty Vehicles

§ 86.1201–83 Applicability.

(a) The provisions of this subpart are applicable to new gasoline-fueled heavy-duty vehicles.

(b) Provisions of this subpart apply to tests performed by both the Administrator and motor vehicle manufacturers.

(c) Test procedures and equipment other than those described in this subpart may be used by the vehicle manufacturer if shown to yield results which correlate with results yielded by those described in this subpart (with the reference driving schedule described in § 86.1215–83(a)) and if approved in advance by the Administrator.

§ 86.1202–83 Definitions.

Applicable definitions in sections (§§) 86.077–2, 86.078–2, 86.079–2, 86.080–2, 86.081–2 and 86.083–2 apply to this subpart.

§ 86.1203–83 Abbreviations.

The abbreviations in § 86.079–3 apply to this subpart.

§ 86.1204 [Reserved]

§ 86.1205–83 Introduction; structure of subpart.

(a) This subpart describes the equipment required and the procedures to follow in order to determine evaporative emission levels from gasoline-fueled heavy-duty vehicles.

(b) Three topics are addressed in this subpart. Sections 86.1206–83 through 86.1215–83 set forth specifications and equipment requirements; §§ 86.1216–83 through 86.1226–83 discuss calibration methods and frequency; test procedures and data requirements are listed (in approximate order of performance) in §§ 86.1227–83 through 86.1245–83.

§ 86.1206–83 Equipment required; overview.

This subpart specifies procedures for testing of heavy-duty vehicles. Equipment required and specifications are as follows:

(a) *Evaporative emissions tests.* § 86.1207–83 specifies the necessary equipment.

(b) *Fuel, analytical gas, and driving schedule specifications.* Fuel specifications for emission testing and for service accumulation are specified in

§ 86.1213–83. Analytical gases are specified in § 86.1214–83. Both vehicle preconditioning for the diurnal loss test and vehicle operation prior to the hot soak loss test include operation on a chassis dynamometer. The driving cycle (EPA heavy-duty vehicle urban dynamometer driving schedule) is specified in § 86.1215–83.

§ 86.1207–83 Sampling and analytical system; evaporative emissions.

The following is a description of the components which will be used in evaporative emissions sampling systems for testing under this subpart.

(a) *Evaporative emission measurement enclosure.* The enclosure shall be readily sealable, rectangular in shape, with space for personnel access to all sides of the vehicle. When sealed, the enclosure shall be gas tight in accordance with § 86.1217–83. Interior surfaces must be impermeable to hydrocarbons. At least one surface shall be constructed of flexible, impermeable material to allow for minor volume changes which result from temperature changes. Wall design should promote maximum dissipation of heat, and no interior surface temperatures shall be less than 68° F (20° C).

(b) *Evaporative emission hydrocarbon analyzer.* A hydrocarbon analyzer utilizing the hydrogen flame ionization principle (FID) shall be used to monitor the atmosphere within the enclosure. Instrument bypass flow may be returned to the enclosure. The FID shall have a response time to 90 percent of final reading of less than 1.5 seconds, and be capable of meeting performance requirements expressed as a function of C_{std}, where C_{std} is the specific enclosure hydrocarbon level, in ppm, corresponding to the evaporative emission standard.

(1) Stability of the analyzer shall be better than 0.01 C_{std} ppm at zero and span over a 15-minute period on all ranges used.

(2) Repeatability of the analyzer, expressed as one standard deviation, shall be better than 0.005 C_{std} ppm on all ranges used.

(c) *Evaporative emission hydrocarbon data recording system.* The electrical output of the FID shall be recorded at least at the initiation and termination of each diurnal and hot soak. The recording may be by means of a strip chart potentiometric recorder, by use of an online computer system, or by other suitable means. In any case, the recording system must have operational characteristics (signal to noise ratio, speed of response, etc.) equivalent to or better than those of the signal source being recorded, and must provide a permanent record of results. The record shall show a positive indication of the initiation and completion of each soak.

(d) *Tank fuel heating system.* The tank fuel heating system shall consist of a heat source and a temperature controller. A typical heat source is a 2000 W heating pad. Other sources may be used as required by circumstances. The temperature controller may be manual, such as a variable voltage transformer, or may be automated. The heating system must not cause hot spots on the tank wetted surface which could cause local overheating of the fuel. Heat must not be applied to the vapor in the tank above the liquid fuel. The temperature controller must be capable of controlling the fuel tank temperature during the diurnal soak to within ±3°F (1.7°C) of the following equation:

$$F = T_o + 0.4t$$

or for SI units:

$$C = T_o + (2/9)t$$

Where:

F = Temperature in °F
C = Temperature in °Ct
t = Time since start of test in minutes
T_o = Initial temperature

(e) *Temperature recording system.* Strip chart recorder(s) or an automatic data processor shall be used to record enclosure ambient and vehicle fuel tank temperature at least once every minute. The temperature recorder or data processor shall have a time accuracy of ±15s, a time precision of ±15s and be capable of resolving temperature to ±0.75°F (0.42°C). The temperature recording system (recorder and sensor) shall have an accuracy of ±3°F (1.7°C). Two ambient temperature sensors, connected to provide one average output, shall be located in the enclosure. These sensors shall be located at the approximate vertical centerline of each side wall extending 4 inches (nominally) into the enclosure at a height of 3±0.5 ft (0.9+0.2 m). The vehicle fuel tank temperature sensor shall be located in the fuel tank so as to measure the temperature of the prescribed test fuel at the approximate mid-volume of the fuel. Manufacturers shall arrange that vehicles furnished for testing at Federal certification facilities be equipped with iron-constantan Type J thermocouples for measurement of fuel tank temperature.

(f) *Purge blower.* One or more portable or fixed blowers shall be used to purge the enclosure. The blowers shall have sufficient flow capacity to reduce the enclosure hydrocarbon concentration from the test level to the ambient level between tests. Actual flow capacity will depend upon the time available between tests.

(g) *Mixing blower.* One or more blowers or fans with a total capacity of 250 to 750 cfm per 1000 ft^3 of enclosure volume shall be used to mix the contents of the enclosure during evaporative emission testing. The mixing blower(s) shall be arranged such that a uniform concentration is maintained. No portion of the air stream shall be directed towards the vehicle.

§§ 86.1208–86.1212 [Reserved]

§ 86.1213–83 Fuel specifications.

(a) Gasoline having the following specifications will be used in emissions testing.

Item	ASTM	Leaded	Unleaded
Octane, research, minimum	D2699	98	98
Sensitivity, minimum		7.5	7.5
Lead (organic), grams/U.S. gallon		[1] 1.4	0.00–0.05
Distillation range:			
IBP, degrees Fahrenheit	D86	75–95	75–95
10 pct, point, degrees Fahrenheit	D86	120–135	120–135
50 pct, point, degrees Fahrenheit	D86	200–230	200–230
90 pct, point, degrees Fahrenheit	D86	300–325	300–325
EP, degrees Fahrenheit (maximum)	D86	415	415
Sulphur, weight percent, maximum	D1266	0.10	0.10
Phosphorus, grams/U.S. gallon, maximum [1]		0.01	0.005
RVP, pounds per square inch	D323	8.7–9.2	8.7–9.2
Hydrocarbon composition:			
Olefins, percent, maximum	D1319	10	10
Aeromatics, percent, maximum	D1319	35	35
Saturates	D1319	([2])	([2])

[1] Minimum.
[2] Remainder.

(b) Gasoline representative of commercial gasoline which will be generally available through retail outlets shall be used in service accumulation. For leaded gasoline the minimum lead

content shall be 1.4 grams per U.S. gallon, except that where the Administrator determines that vehicles represented by a test vehicle will be operated using gasoline of different lead content than that prescribed in this paragraph, he may consent in writing to use a gasoline with a different lead content. The octane rating of the gasoline used shall be no higher than 1.0 research octane number above the minimum recommended by the manufacturer and have a minimum sensitivity of 7.5 octane numbers, where sensitivity is defined as the research octane number minus the motor octane number. The Reid vapor pressure of the gasoline used shall be characteristic of the motor fuel used during the season in which the service accumulation takes place.

(c) The specification range of the gasoline to be used under paragraph (b) of this section shall be reported.

§ 86.1214–83 Analytical gases.

(a) Analyzer gases.

(1) Gases for the hydrocarbon analyzer shall be single blends of propane using air as the diluent.

(2) Fuel for the evaporative emission enclosure FID shall be a blend of 40±2% hydrogen with the balance being helium. The mixture shall contain less than 1 ppm equivalent carbon response. 98 to 100 percent hydrogen fuel may be used with advance approval by the Administrator.

(3) The allowable zero gas (air or nitrogen) impurity concentrations shall not exceed 1 ppm equivalent carbon response, 1 ppm carbon monoxide, 0.04 percent (400 ppm) carbon dioxide and 0.1 ppm nitric oxide.

(4) "Zero grade air" includes aritificial "air" consisting of a blend of nitrogen and oxygen with oxygen concentrations between 18 and 21 mole percent.

(5) The use of proportioning and precision blending devices to obtain the required analyzer gas concentrations is allowable provided their use has been approved in advance by the Administrator.

(b) Calibration gases shall be traceable to within ±1 percent of NBS gas standards.

(c) Span gases shall be accurate to within ±2 percent of true concentration, where true concentration refers to NBS gas standards.

§ 86.1215–83 EPA heavy-duty vehicle (HDV) urban dynamometer driving schedule.

(a) The EPA dynamometer driving schedule for heavy-duty vehicles is a 1060 second transient speed versus time cycle which is designed to simulate gasoline-fueled HDV operation in urban areas. A second by second listing of this schedule is given in Appendix I(d) of this part. 33% of the cycle is idle operation, and the average vehicle speed is 18.9 mph (30.4 km/hr).

(b) The speed tolerance at any given time on the transient speed vs. time driving schedule is defined by upper and lower limits. The upper limit is 4 mph (6.4 km/hr) higher than the highest point on the trace within 1 second of the given time. The lower limit is 4 mph (6.4 km/hr) lower than the lowest point on the trace within 1 second of the given time. Speed variations greater than the tolerances (such as may occur during gear changes) are acceptable provided they occur for less than 2 seconds on any occasion. Speeds lower than those prescribed are acceptable provided the vehicle is operated at maximum available power during such occurrences.

(c) The Administrator will use this driving schedule when conducting evaporative emission tests.

§ 86.1216–83 Calibrations; frequency and overview.

(a) Calibrations shall be performed as specified in §§ 86.1217–83 through 86.1226–83.

(b) At least yearly or after any maintenance which could alter background emission levels, enclosure background emission measurements shall be performed.

(c) At least monthly or after any maintenance which could alter calibration, the following calibrations and checks shall be performed:

(1) Calibrate the hydrocarbon analyzer (see § 86.1221–83).

(2) Calibrate the dynamometer. If the dynamometer receives a weekly performance check (and remains within calibration) the monthly calibration need not be performed (see § 86.1218–83).

(3) Perform a hydrocarbon retention check and calibration on the evaporative emission enclosure (see § 86.1217–83).

§ 86.1217–83 Evaporative emission enclosure calibrations.

The calibration of the evaporative emission enclosure consists of three parts: Initial and periodic determination of enclosure background emissions; initial determination of enclosure internal volume; and periodic hydrcarbon retention check and calibration.

(a) *Initial and periodic determination of enclosure background emissions.* Prior to its introduction into service, annually therafter, and after any repair which can affect the enclosure background emissions, the enclosure shall be checked to determine that it does not contain materials which will themselves emit hydrocarbons. Proceed as follows:

(1) Zero and span (calibrate if required) the hydrocarbon analyzer.

(2) Purge the enclosure until a stable background hydrocarbon reading is obtained.

(3) Turn on the mixing blower (if not already on).

(4) Seal enclosure and measure background hydrocarbon concentration, enclosure termperature, and barometric pressure. These are the initial readings C_{HCi}, T_i, and P_{Bi} for the enclosure background determination.

(5) Allow the enclosure to stand undisturbed without sampling for four hours.

(6) Measure the hydrocarbon concentration on the same FID. This is the final concentration, C_{HCf}. Also measure final temperature and barometric pressure.

(7) Calculate the mass change of hydrocarbons in the enclosure according to the equations in paragraph (d) of this section. The enclosure background emissions shall not be greater than 0.4g for the 4 hours.

(b) *Initial determination of enclosure internal volume.* Prior to its introduction into service the enclosure internal volume shall be determined by the following procedure.

(1) Carefully measure the internal length, width and height of the enclosure, accounting for irregularities (such as braces, cooling system components, etc.) and calculate the internal volume.

(2) Perform an enclosure calibration check according to subparagraphs (1) through (7) of paragraph (c) of this section.

(3) If the calculated mass does not agree within ±2 percent of the injected propane mass, then corrective action is required.

(c) *Hydrocarbon retention check and calibration.* The hydrocarbon retention check provides a check upon the calculated volume and also measures the leak rate. Prior to its introduction into service and at least monthly thereafter the enclosure leak rate shall be determined as follows:

(1) Zero and span (calibrate if required) the hydrocarbon analyzer.

(2) Purge the enclosure until a stable background hydrocarbon reading is obtained.

(3) Turn on the mixing bower(s) (if not already on).

(4) Seal enclosure and measure background hydrocarbon concentration,

temperature and barometric pressure. These are the initial readings C_{HCi}, T_i and P_{Bi} for the enclosure calibration.

(5) Inject into the enclosure a known quantity of pure propane. (4g is a convenient quantity.) The propane may be measured by volume flow or by mass measurement. The method used to measure the propane shall have an accuracy and precision of ±0.5 percent of the measured value.

(6) After a minimum of 5 minutes of mixing, analyze the enclosure atmosphere for hydrocarbon content; also record temperature and pressure. These measurements are the final readings for the enclosure calibration as well as the initial readings for the retention check.

(7) To verify the enclosure calibration calculate the mass of propane using the measurements taken in steps (4) and (6) using the equations in paragraph (d) of this section. This quantity must be within ±2 percent of that measured in step (5) above.

(8) Allow the enclosure to remain sealed for a minimum of 4 hours without sampling and with the mixing blower(s) operating. After 4 hours analyze the enclosure atmosphere for hydrocarbon content; record temperature and barometric pressure. These are the final readings for the hydrocarbon retention check.

(9) Calculate, the hydrocarbon mass using the equations in paragraph (d) and the readings taken in (8). It may not differ by more than ±4 percent of the value in step (6).

(d) *Calculations.* The calculation of net hydrocarbon mass change is used to determine enclosure background and leak rate. It is also used to check the enclosure volume measurement. The mass change is calculated from the initial and final readings of hydrocarbon concentration, termperature and pressure according to the following equation:

$$M_{HC} = kV \times 10^{-4} \left(\frac{C_{HCf} P_{Bf}}{T_f} - \frac{C_{HCi} P_{Bi}}{T_i} \right)$$

Where:

M_{HC} = Hydrocarbon mass change, g.
C_{HC} = Hydrocarbon concentration as ppm carbon.
V = Enclosure volume, ft^3 (m^3), as measured in paragraph (b)(1) of this section.
P_B = Barometric pressure, in. Hg (kPa).
T = Enclosure ambient temperature, R(K).
k = 3.05, for SI units k = 17.60.
i = Indicates initial reading.
f = Indicates final reading.

Note.—Hydrocarbon concentration is stated in ppm carbon, that is, ppm propane × 3. Expressions in parentheses are for SI units.

§ 86.1218–83 Dynamometer calibration.

(a) The dynamometer shall be calibrated at least once each month or performance verified at least once each week and then calibrated as required. The calibration shall consist of the manufacturer's recommended calibration procedure plus a determination of the dynamometer frictional power absorption. If the dynamometer is to be used for driving only the reference (transient) schedule, the frictional power absorption needs to be determined only at 50.0 mph (80.5 km/hr). If the dynamometer is to be used for driving the steady-state cycle, the frictional power absorption needs to be determined through the range of 15 to 50 mph. One method for determining dynamometer frictional power absorption at 50.0 mph (80.5 km/hr) is described below. The same general method can be use at other speeds. Other methods may be used if shown to yield equivalent results. The measured absorbed road power includes the dynamometer friction as well as the power absorbed by the power absorption unit. The dynamometer is driven above the test speed range. The device used to drive the dynamometer is then disengaged from the dynamometer and the roll(s) is (are) allowed to coastdown. The kinetic energy of the system is dissipated by the dynamometer. This method neglects the variations in roll bearing friction due to the drive axle weight of the vehicle. In the case of dynamometers with paired rolls, the inertia and power absorption of the free (rear) roll may be neglected if its inertia is less than 3.0% of the total equivalent inertia required for vehicle testing.

(1) Devise a method to determine the speed of the roll(s) to be measured for power absorption. A fifth wheel, revolution pickup, or other suitable means may be used.

(2) Place a vehicle on the dynamometer or devise another method of driving the dynamometer.

(3) If the dynamometer is capable of simulating more than a single inertia mass, engage the inertial flywheel or other inertial simulation system for the most common vehicle mass category for which the dynamometer is used. In addition, other vehicle mass categories may be calibrated, if desired.

(4) Drive the dynamometer up to 50 mph (80.5 km/hr).

(5) Record indicated road power.

(6) Drive the dynamometer up to 60.0 mph (96.9 km/hr).

(7) Disengage the device used to drive the dynamometer.

(8) Record the time for the dynamometer roll(s) to coastdown from 55.0 mph (88.5 km/hr) to 45.0 mph (72.4 km/hr).

(9) Adjust the power absorption unit to a different level.

(10) Repeat steps (4) to (8) above sufficient times to cover the range of road power used.

(11) Calculate absorbed road power (HP_d). (See paragraph (c) of this section.)

(12) Plot indicated road load power at 50 mph (80.5 km/hr) versus road load power at 50 mph (80.5 km/hr).

(b) The performance check consists of conducting a dynamometer coastdown and comparing the coastdown time to that recorded during the last calibration. If the coastdown times differ by more than 1 second or by 5 percent of the time recorded during the last calibration, which ever is greater, a new calibration is required.

(c) Calculations. The road load power actually absorbed by each roll assembly (or roll-inertia weight assembly) of the dynamometer is calculated from the following equation:

$$HP_d = (½)\,(W/32.2)\,(V_1^2 - V_2^2)/55t$$

Where:

HP_d = Power, horsepower (kilowatts)
W = Equivalent inertia, lb (kg)
V_1 = Initial velocity, ft/s (m/s) (55 mph = 88.5 km/h = 80.67 ft/s = 24.58 m/s)
V_2 = Final velocity, ft/s (m/s) (45 mph = 72.4 km/h = 66 ft/s = 20.11 m/s)
t = Elapsed time for rolls to coast from 55 mph to 45 mph (88.5 to 72.4 km/hr).

(Expressions in parenthesis are for SI units). When the coastdown is from 55 to 45 mph (88.5 to 72.4 km/hr) the above equation reduces to:

$$HP_d = 0.06073\,(W/t)$$

For SI units:

$$HP_d = 0.09984\,(W/t)$$

The total road load power actually absorbed by the dynamometer is the sum of the absorbed road load power of each roll assembly.

§§ 86.1219–86.1220 [Reserved]

§ 86.1221–83 Hydrocarbon analyzer calibration.

The FID hydrocarbon analyzer shall receive the following initial and periodic calibration.

(a) Initial and periodic optimization of detector response. Prior to its introduction into service and at least annually thereafter the FID hydrocarbon analyzer shall be adjusted for optimum hydrocarbon response. Alternate methods yielding equivalent results to the procedure listed below may be used.

(1) Follow the manufacturer's instructions for instrument startup and basic operating adjustment using the appropriate fuel and zero-grade air.

(2) Optimize on the most common operating range. Introduce into the analyzer, a propane in air mixture with a propane concentration equal to approximately 90 percent of the most common operating range.

(3) Select an operating fuel flow rate that will give near maximum response and least variation in response with minor fuel flow variations.

(4) To determine the optimum air flow, use the fuel flow setting determined above and vary air flow.

(5) After the optimum flow rates have been determined, they are recorded for future reference.

(b) Initial and periodic calibration. Prior to its introduction into service and monthly thereafter the FID hydrocarbon analyzer shall be calibrated on all normally used instrument ranges. Use the same flow rate as when analyzing samples.

(1) Adjust analyzer to optimize performance.

(2) Zero the hydrocarbon analyzer with zero-grade air.

(3) Calibrate on each normally used operating range with propane-in-air calibration gases having nominal concentrations of 15, 30, 45, 60, 75, and 90 percent of that range. For each range calibrated, if the deviation from a least-squares best-fit straight line is 2 percent or less of the value at each data point, concentration values may be calculated by use of a single calibration factor for that range. If the deviation exceeds 2 percent at any point, the best-fit non-linear equation which represents the data to within 2 percent of each test point shall be used to determine concentration.

§ 86.1222–86.1225 [Reserved]

§ 86.1226–83 Calibration of other equipment.

Other test equipment used for testing shall be calibrated as often as required by the manufacturer or as necessary according to good practice.

§ 86.1227–83 Test procedures; overview.

(a) The overall test consists of prescribed sequences of fueling, parking, and operating conditions. Vehicles are tested only for evaporative emissions.

(b) The evaporative emission test (gasoline-fueled vehicles only) is designed to determine hydrocarbon evaporative emissions as a consequence of diurnal temperature fluctuation, urban driving and hot soaks during engine-off periods. It is associated with a series of events representative of heavy-duty vehicle operation, which result in hydrocarbon vapor losses. The test procedure is designed to measure:

(1) Diurnal breathing losses resulting from daily temperature changes, measured by the enclosure technique;

(2) Running losses from suspected sources (if indicated by engineering analysis or vehicle inspection) resulting from a simulated trip on a chassis dynamometer, measured by carbon traps; and

(3) Hot soak losses which result when the vehicle is parked and the hot engine is turned off, measured by the enclosure technique.

§ 86.1228–83 Transmissions.

(a) All test conditions, except as noted, shall be run in a manner representative of in-use operation, and where appropriate, according to the manufacturer's recommendation to the ultimate purchaser.

(b) Except for the first idle mode, idle modes less than one minute in length shall be run with automatic transmissions in "Drive" and the wheels braked; manual transmissions shall be in gear with the clutch disengaged, except first idle. The first idle mode and idle modes longer than one minute in length shall be run with automatic transmissions in "Neutral", and manual transmissions shall be in "Neutral" with the clutch engaged (clutch may be disengaged for engine start-up).

(c) The vehicle shall be driven with minimum accelerator pedal movement to maintain the desired operation.

(d) Accelerations shall be driven smoothly according to the manufacturer's recommendation to the ultimate purchaser. For manual transmissions, the operator shall accomplish each shift with minimum time. If the vehicle cannot accelerate at the specified rate, the vehicle shall be operated at maximum available power until the vehicle speed reaches the value prescribed for that time in the driving schedule.

(e) For those deceleration modes which decelerate to zero, manual transmission clutches shall be depressed when the speed drops below 15 mph (24.1 km/hr), when engine roughness is evident, or when engine stalling is imminent.

§ 86.1229–83 Dynamometer load determination.

(a) Flywheels, electrical or other means of simulating inertia shall be used. The value of equivalent inertia weight shall be within 250 pounds of the loaded vehicle weight (LVW). Loaded vehicle weight is defined as follows:

(1) For test vehicles which have an actual weight less than 0.7×(GVWR),

LVW=0.7×(Gross Vehicle Weight Rating).

(2) For test vehicles which have an actual weight (as tested) greater than 0.7×(GVWR),

LVW=Actual Weight of Test Vehicle.

(b) Power absorption unit adjustment.

(1) The power absorption unit shall be adjusted to reproduce road load power at 50 mph true speed. The indicated road load power setting shall take into account the dynamometer friction. The relationship between road load (absorbed) power and indicated road load power for a particular dynamometer shall be determined by the procedure outlined in § 86.1218–83 or other suitable means.

(2) The road load power used shall be determined from the following equation:

$$RLP=0.67\ (H-0.75)W+0.00125[LVW-(N\times DW)]$$

where

RLP=Road Load Power at 50 mph (horsepower).
H=Vehicle overall maximum height (feet).
W=Vehicle overall maximum width (feet).
LVW=Loaded vehicle weight (pounds).
DW=Vehicle weight supported by the dynamometer (pounds).
N=Number of dynamometer rolls supporting a tire.

or, for vehicles which the manufacturer could have certified by the light-duty truck (LDT) test procedure as allowed in the optional certification provision (§ 86.074–1(b)), the manufacturer may determine the road load power by an alternate procedure if approved in advance by the Administrator. For vehicles which the manufacturer does choose to certify by the light-duty truck test procedure, the evaporative emission test procedure (and standard) will be that specified by the light-duty truck regulations.

§ 86.1230–83 Test sequence; general requirements.

(a) The test sequence shown in Figure M83–1 shows the steps encountered as the test vehicle undergoes the test procedure.

(b) Ambient temperature levels encountered by the test vehicle throughout the test sequence shall not be less than 68°F (20°C) nor more than 86°F (30°C). The vehicle shall be approximately level during all phases of the test sequence to prevent abnormal fuel distribution.

BILLING CODE 6560-01-M

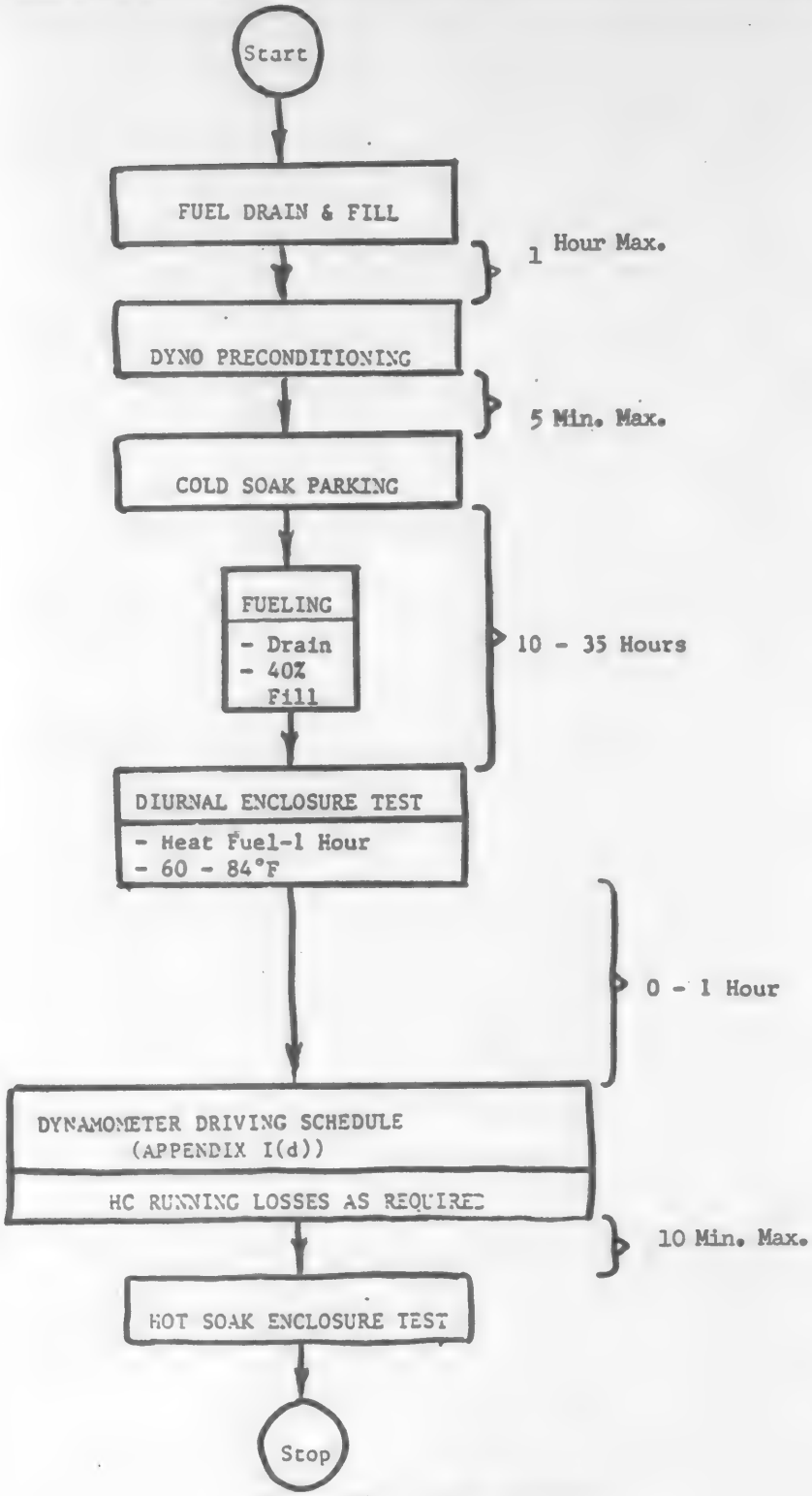

Figure M83-1 - Test Sequence

BILLING CODE 6560-01-C

§ 86.1231–83 Vehicle preparation.

(a) Prepare the fuel tank(s) for recording the temperature of the prescribed test fuel at the approximate mid-volume of the fuel when the tank is 40% full.

(b) Provide additional fittings and adapters, as required, to accommodate a fuel drain at the lowest point possible in the tank(s) as installed on the vehicle.

§ 86.1232–83 Vehicle preconditioning.

(a) The vehicle shall be moved to the test area and the following operations performed:

(1) The fuel tank(s) shall be drained through the provided fuel tank(s) drain(s) and filled to the prescribed "tank fuel volume" with the specified test fuel, § 86.1213–83. For the above operations the evaporative emission control system shall neither be abnormally purged nor abnormally loaded.

(2) Within one hour of being fueled the vehicle shall be placed, either by being driven or pushed, on a dynamometer and operated through one HDV urban dynamometer driving schedule, (see § 86.1215–83). A test vehicle may not be used to set dynamometer horsepower.

(3) The Administrator may choose to conduct or require the conduct of additional preconditioning to insure that the evaporative emissions control system is stabilized. The additional preconditioning shall consist of an initial one hour minimum soak and one, two or three driving cycles of the dynamometer driving schedule, as described in paragraph (a)(2) of this section, each followed by a soak of at least one hour with engine off, engine compartment cover closed and cooling fan off. The vehicle may be driven off the dynamometer for the soak period which follows each driving cycle.

(b) After completion of preconditioning the vehicle shall be driven off the dynamometer and parked. The engine shall be turned off within five minutes of completion of preconditioning. The vehicle may be pushed to its parking location after its engine has been turned off.

§ 86.1233–83 Diurnal breathing loss test.

(a) Following vehicle preparation and vehicle preconditioning procedures described in §§ 86.1231–83 and 86.1232–83 the diurnal test shall start not less than 10 or more than 35 hours after the end of the preconditioning procedure. The start of vehicle operation shall follow the end of the diurnal test within one hour.

(b) The evaporative emissions enclosure shall be purged for several minutes immediately prior to the test.

Note.—If at anytime the hydrocarbon concentration exceeds 15,000 ppm C the enclosure should be immediately purged. This concentration provides a 4:1 safety factor against the lean flammability limit.

(c) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the test.

(d) If not already on, the evaporative enclosure mixing fan(s) shall be turned on at this time.

(e) For vehicles with multiple tanks, the largest tank shall be designated as the primary tank and shall be heated in accordance with the procedures described in paragraph (1) of this section. All other tanks shall be designated as auxiliary tanks and shall undergo a similar heat build such that the fuel temperature shall be within 3° F (1.7° C) of the primary tank.

(f) Immediately prior to the diurnal breathing loss test, the fuel tank(s) of the prepared vehicle shall be drained and recharged with the specified test fuel, § 86.1213–83, to the prescribed "tank fuel volume", defined in § 86.078–2. The temperature of the fuel prior to its delivery to the fuel tank shall be between 50 and 60° F (10 and 16° C). The fuel tank cap(s) is not installed until the diurnal heat build begins.

(g) The test vehicle, with the engine shut off, shall be moved into the evaporative emission enclosure, the test vehicle windows and any storage compartments shall be opened, the fuel tank temperature sensor shall be connected to the temperature recording system, and, if required, the heat source shall be properly positioned with respect to the fuel tank(s) and/or connected to the temperature controller.

(h) The temperature recording system shall be started.

(i) The fuel may be artificailly heated to the starting diurnal temperature, 60 ± 2°F(16 ± 1.1°C).

(j) When the fuel temperature recording system reaches at least 58°F (14°C), immediately:

(1) Install fuel tank cap(s).

(2) Turn off purge blowers, if not already off at this time.

(3) Close and seal enclosure doors.

(k) When the fuel temperature recording system reaches 60 ± 2°F(16 ± 1.1°C) immediately:

(1) Analyze enclosure atmosphere for hydrocarbons and record. This is the initial (time = 0 minutes) hydrocarbon concentration, C_{HCi} (see § 86.1243–83).

(2) Start dirunal heat build and record time. This commences the 60 ± 2 minute test period.

(l) The fuel shall be heated in such a way that its temperature change conforms to the following function to within ±3°F (± 1.7°C);

$$F = T_o + 0.4t$$

for SI units, $c = T_o + (2/9)t$

Where:

F = fuel temperature, °F
C = fuel temperature, °C
t = time since beginning of test, minutes
T_o = initial temperature.

After 60 ±2 minutes of heating, the fuel temperature rise shall be 24 ±1°F (13.3 ±0.5°C).

(m) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the end of the diurnal test.

(n) The end of the diurnal breathing loss test occurs 60 ±2 minutes after the heat build begins, paragraph (k)(2). Analyze the enclosure atmosphere for hydrocarbons and record. This is the final (time=60 minutes) hydrocarbon concentration, C_{HCf} (see § 86.1234–83). The time (or elapsed time) of this analysis shall be recorded.

(o) The heat source shall be turned off and the enclosure doors unsealed.

(p) The heat source shall be moved away from the vehicle, if required, and/or disconnected from the temperature controller, the fuel tank temperature sensor shall be disconnected from the temperature recording system, and the test vehicle windows and any storage compartments may be closed. The vehicle shall be either driven or pushed out of the evaporative emission enclosure.

§ 86.1234–83 Running loss test.

If an engineering analysis or vehicle inspection indicates the possibility of evaporative emissions during vehicle operation, evaporative emission running loss measurements shall be made during vehicle operation or the dynamometer in preparation for the hot soak test. Since running loss measurements cannot be made in the enclosure, the equipment described in Subpart B, § 86.177–17 for running loss measurements shall be used to collect these emissions.

(a) The procedure in § 86.1235–83 shall be followed.

(b) Prior to the initiation of the dynamometer hot soak preparation run, the vapor loss measurement system shall be connected to all suspected sources of running loss evaporative emissions.

(c) Operation on the dynamometer prior to the hot soak test shall be conducted according to the procedures of §§ 86.1235–83 through 86.1237–83.

(d) Within one minute after the end of hot soak preparations run, the vapor

loss measurement system shall be disconnected from the vehicle and the inlets and outlets sealed.

(e) Within one hour from the end of the running loss measurement, the vapor collection traps shall be weighed.

§ 86.1235–83 Dynamometer procedure.

(a) The dynamometer run consists of one HDV urban dynamometer driving schedule cycle starting within one hour after completion of the diurnal loss test. This run includes engine startup (with all accessories turned off) and operation over the driving schedule.

(b) During dynamometer operation, one or more cooling fans shall be positioned so as to direct cooling air to the vehicle in an appropriate manner. The engine compartment cover shall be closed. If, however, the manufacturer can show that the engine compartment cover must be open to provide a test representative of field operation, the Administrator will allow the engine cover to be open. In the case of vehicles with front engine compartments, the fan(s) shall be squarely positioned within 12 inches of the vehicle. In the case of vehicles with rear engine compartments (or if special designs make the above impractical), the cooling fan(s) shall be placed in a position to provide sufficient air to maintain vehicle cooling. The fan capacity shall normally not exceed 10,600 cfm (5.0 m^3/s). If, however, the manufacturer can show that during field operation the vehicle receives additional cooling, and that such additional cooling is needed to provide a representative test, the fan capacity may be increased or additional fans used.

(c) The vehicle speed as measured from the dynamometer rolls shall be used.

(d) Practice runs over the prescribed driving schedule may be performed at test points, provided emissions are not measured, for the purpose of finding the minimum throttle action to maintain the proper speed-time relationship, or to permit test procedure adjustments.

Note.—When using two-roll dynamometers a truer speedtime trace may be obtained by minimizing the rocking of the vehicle in the rolls. The rocking of the vehicle changes the tire rolling radius on each roll. This rocking may be minimized by restraining the vehicle horizontally (or nearly so) by using a cable and winch, or chain.

(e) Drive wheel tires shall be inflated to the maximum gauge pressure recommended to the ultimate purchaser. If drive wheel tires have a maximum recommended inflation gauge pressure of less than 45 psi (310 kPa), they may be inflated up to a guage pressure of 45 psi (310 kPa) in order to prevent tire damage. The drive wheel tire pressure shall be reported with the test results.

(f) If the dynamometer has not been operated during the 2-hour period immediately preceding the test it shall be warmed up for 15 minutes by operating at 30 mph (48 km/h) using a non-test vehicle or as recommended by the dynamometer manufacturer.

(g) If the dynamometer horsepower must be adjusted manually, the power shall be set within 1 hour prior to dynamometer operation preceding the hot soak test. The test vehicle shall not be used to make the adjustment.

(h) If the dynamometer horsepower is selected by automatic control, the power may be set anytime prior to the beginning of the driving cycle.

(i) Multiple drive axle vehicles will be tested in one axle drive mode of operation. Full time multiple drive axle vehicles will have all but one axle temporarily disengaged by the vehicle manufacturer. Multiple drive axle vehicles which can be manually shifted to a one axle drive mode will be tested in the one axle drive mode of operation, unless this would pose a safety hazard, in which case all but one axle will be temporarily disengaged by the vehicle manufacturer.

§ 86.1236–83 Engine starting and restarting.

(a) Starting:

(1) The engine shall be started (including choke operation) according to the manufacturer's recommended starting procedures in the owner's manual. The initial idle period shall begin when the engine starts.

(2) The operator may use the choke, accelerator pedal, etc., where necessary to keep the engine running.

(3) If the manufacturer's operating instructions in the owner's manual do not specify a warm engine starting procedure, the engine shall be started by depressing the accelerator pedal about half way and cranking the engine until it starts.

(4) If the vehicle does not start after 10 seconds of cranking, cranking shall cease and the reason for failure to start shall be determined. If failure to start is an operational error, the vehicle shall be rescheduled for the running loss test. If failure to start is caused by a vehicle malfunction, corrective action of less than 30 minutes duration may be taken, and the test continued. When the engine starts, the driving schedule timing sequence shall begin. If failure to start is caused by vehicle malfunction and the vehicle cannot be started, the test shall be voided, the vehicle removed from the dynamometer, and corrective action may be taken. The reasons for the malfunction (if determined) and the corrective action taken shall be reported to the Administrator.

(b) Stalling: (1) If the engine stalls during an idle period, the engine shall be restarted immediately and the driving schedule continued. If the engine cannot be started soon enough to allow the vehicle to follow the next acceleration as prescribed, the driving schedule indicator shall be stopped. When the vehicle restarts, the driving schedule indicator shall be reactivated.

(2) If the engine stalls during some operating mode other than idle, the driving schedule indicator shall be stopped, the vehicle shall then be restarted and accelerated to the speed required at that point in the driving schedule and the driving schedule continued. During acceleration to this point, shifting shall be performed in accordance with § 86.1228–83.

(3) If the vehicle will not restart within one minute the test shall be voided, the vehicle removed from the dynamometer, corrective action taken, and the vehicle rescheduled for testing. The reason for the malfunction (if determined) and the corrective action taken shall be reported to the Administrator.

§ 86.1237–83 Dynamometer runs.

(a) The vehicle shall be either driven or pushed onto the dynamometer; however, if driven, the period of engine operation between the end of the diurnal loss test and beginning of the hot soak preparation run shall not exceed 3 minutes, and the vehicle shall be driven at minimum throttle. The dynamometer run shall follow the diurnal heat build by not more than one hour. The vehicle shall be stored prior to dynamometer operation in such a manner that it is not exposed to precipitation (e.g., rain or dew).

(b) The following steps be taken for the dynamometer run:

(1) Place drive wheels of vehicles on the dynamometer.

(2) Position the cooling fan(s).

(3) Attach an exhaust tube to the vehicle tailpipe(s).

(4) Start the engine.

(5) Operate the vehicle according to the dynamometer driving schedule (§ 86.1215–83).

(6) At the end of the last deceleration, disconnect the exhaust tube from the vehicle tailpipe(s) and drive vehicle from the dynamometer.

§ 86.1238–83 Hot soak test.

The one-hour hot-soak evaporative emission test shall be conducted immediately following one cycle of the dynamometer driving schedule.

(a) Prior to the completion of the dynamometer cycle, the evaporative emission enclosure shall be purged for several minutes.

(b) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the test.

(c) If not already on, the evaporative enclosure mixing fan(s) shall be turned on at this time.

(d) Upon completion of the dynamometer run the exhaust tube shall be disconnected from the vehicle tailpipe(s), the cooling fan(s) shall be moved, and the vehicle shall be disconnected from the dynamometer and then driven at mimimum throttle to the vehicle entrance of the enclosure.

(e) The vehicle's engine must be stopped before any part of the vehicle enters the enclosure. The vehicle may be pushed or coasted into the enclosure.

(f) The test vehicle windows and any storage compartments shall be opened; if not already open.

(g) The temperature recording system shall be started and the time of engine shut off shall be noted on the evaporative emissions hydrocarbon data recording system.

(h) The enclosure doors shall be closed and sealed within two minutes of engine shutdown and within ten minutes after the end of the dynamometer run.

(i) The 60 ± 0.5 minute hot soak begins when the enclosure doors are sealed. The enclosure atmosphere shall be analyzed and recorded. This is the initial (time = 0 minutes) hydrocarbon concentration, C_{HCi}, for use in calculating evaporative losses, (see § 86.1243–83).

(j) The test vehicle shall be permitted to soak for a period of one hour in the enclosure.

(k) The FID hydrocarbon analyzer shall be zeroed and spanned immediately prior to the end of the test.

(l) At the end of the 60 ± 0.5 minute test period, the enclosure atmosphere shall again be analyzed and the time recorded. This is the final (time = 60 minutes) hydrocarbon concentration, C_{HCf}, for use in calculating evaporative losses, (see § 86.1243–83). This operation completes the evaporative emission measurement procedures.

§ 86.1239—86.1241 [Reserved]

§ 86.1242–83 Records required.

The following information shall be recorded with respect to each test:

(a) Test number.

(b) System or device tested (brief description).

(c) Date and time of day for each part of the test schedule.

(d) Instrument operator.

(e) Driver or operator.

(f) Vehicle: ID number; Manufacturer; Model Year; Engine Family; Evaporative emissions family; Basic engine description (including displacement, number of cylinders, and catalyst usage); Engine maximum power rating and rated speed; Fuel system (including number of carburetors, number of carburetor barrels, fuel injection type, fuel tank(s) capacity and location, and number and size (volume and working capacity) of evaporative control canisters), Engine code; Gross vehicle weight rating; Actual curb weight at zero miles; Actual road load at 50 mph; Transmission configuration; Axle ratio; Vehicle line; Odometer reading; Idle rpm; and Drive wheel tire pressure, as applicable.

(g) Indicated road load power absorptioin at 50 mph (80 km/hr) and dynamometer serial number. As an alternative to recording the dynamometer serial number, a reference to a vehicle test cell number may be used, provided the test cell records show the pertinent information.

(h) All pertinent instrument information such as tuning, gain, serial number, detector number and range. As an alternative, a reference to a vehicle test cell number may be used, with the advance approval of the Administrator, provided test cell calibration records show the pertinent instrument information.

(i) Recorder charts: Identify zero, span and enclosure gas sample traces.

(j) Test cell barometric pressure, humidity, and ambient temperature.

Note.—A central laboratory barometer may be used: *Provided,* That individual test cell barometric pressure are shown to be within ±0.1 percent of the barometric pressure at the central barometer location.

(k) Fuel temperatures as prescribed.

§ 86.1243–83 Calculations; evaporative emissions.

The calculation of the net hydrocarbon mass change in the enclosure is used to determine the diurnal and hot-soak mass emissions. The mass is calculated from initial and final hydrocarbon concentrations in ppm carbon, initial and final enclosure ambient temperatures, initial and final barometric pressures, and net enclosure volume using the following equation:

$$M_{HC} = \frac{kV_n \times}{10^{-6}} \left(\frac{C_{HCf}P_{Bf}}{T_f} - \frac{C_{HCi}P_{Bi}}{T_i} \right)$$

Where:

M_{HC} = hydrocarbon mass, g.

C_{HC} = hydrocarbon concentration as ppm carbon.

V_n = net enclosure volume ft³ (m³) as determined by subtracting 100 ft³ (2.84 m³) (volume of vehicle with windows and any storage compartments open) from the enclosure volume. A manufacturer may use the measured volume of the vehicle (instead of the nominal 100 ft³) provided the measured volume is determined and used for all vehicles tested by that manufacturer.

P_B = barometric pressue, in. Hg (kPa).

T = enclosure ambient temperature, R (K).

k = .208 (12 + H/C); for SI units, k = 1.2 (12 + H/C).

Where:

H/C = Hydrogen-carbon ratio.

H/C = 2.33 for diurnal emissions.

H/C = 2.2 for hot soak emissions.

i = Indicates initial reading.

f = Indicates final reading.

The final reported results shall be computed by summing the individual evaporative emissions results determined for the diurnal breathing loss test, running loss test, and the hot soak test.

§ 86.1244, 86.1245 [Reserved]

23. It is proposed that Appendix I to Part 86 be amended by adding a new paragraph (d) to read as follows:

Appendix I—Urban Dynamometer Driving Schedules

* * * * *

(d) EPA Urban Dynamometer Driving Schedule for Heavy-Duty Vehicles.

BILLING CODE 6560-01-M

SPEED VERSUS TIME SEQUENCE

RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)
0.	0.0	50.	12.26	100.	31.01	150.	0.0	200.	0.0	250.	0.0	300.	0.24	350.	12.00	400.	19.00	450.	32.85
1.	0.0	51.	14.29	101.	31.00	151.	0.0	201.	0.0	251.	0.0	301.	0.60	351.	11.73	401.	18.86	451.	33.01
2.	0.0	52.	14.56	102.	31.62	152.	0.0	202.	0.0	252.	0.0	302.	0.0	352.	11.00	402.	18.29	452.	34.00
3.	0.0	53.	15.20	103.	33.00	153.	0.0	203.	4.15	253.	0.0	303.	1.42	353.	11.00	403.	19.00	453.	33.68
4.	0.0	54.	15.76	104.	32.37	154.	0.0	204.	6.00	254.	0.0	304.	2.00	354.	11.00	404.	19.61	454.	32.52
5.	0.0	55.	17.00	105.	30.43	155.	0.0	205.	6.00	255.	0.0	305.	3.08	355.	11.90	405.	20.00	455.	32.00
6.	0.0	56.	17.00	106.	30.00	156.	0.0	206.	6.00	256.	0.0	306.	5.63	356.	12.89	406.	20.00	456.	32.00
7.	0.0	57.	17.23	107.	30.00	157.	0.0	207.	5.30	257.	0.0	307.	4.00	357.	10.36	407.	20.00	457.	32.95
8.	0.0	58.	18.77	108.	30.51	158.	0.0	208.	4.14	258.	0.0	308.	4.00	358.	7.26	408.	20.00	458.	33.00
9.	0.0	59.	20.54	109.	32.41	159.	0.0	209.	1.96	259.	0.0	309.	3.34	359.	4.95	409.	20.00	459.	33.00
10.	0.0	60.	14.60	110.	33.00	160.	0.0	210.	0.0	260.	0.0	310.	1.37	360.	4.68	410.	19.45	460.	33.42
11.	0.0	61.	18.14	111.	32.27	161.	0.0	211.	0.0	261.	0.0	311.	1.00	361.	6.68	411.	20.42	461.	34.00
12.	0.0	62.	17.48	112.	32.00	162.	0.0	212.	0.0	262.	0.0	312.	0.0	362.	8.00	412.	21.87	462.	34.74
13.	0.0	63.	17.00	113.	31.04	163.	0.0	213.	0.0	263.	0.0	313.	0.0	363.	7.84	413.	20.97	463.	35.00
14.	0.0	64.	16.34	114.	32.20	164.	0.0	214.	0.0	264.	0.0	314.	0.0	364.	7.00	414.	20.37	464.	35.00
15.	0.0	65.	15.00	115.	33.36	165.	0.0	215.	0.0	265.	0.0	315.	0.0	365.	6.53	415.	22.00	465.	35.00
16.	0.0	66.	15.00	116.	34.00	166.	0.0	216.	0.0	266.	0.0	316.	0.0	366.	7.89	416.	22.00	466.	35.00
17.	0.0	67.	15.00	117.	34.00	167.	0.0	217.	0.0	267.	0.0	317.	0.0	367.	10.57	417.	22.66	467.	35.00
18.	0.0	68.	15.96	118.	34.00	168.	0.0	218.	0.0	268.	0.0	318.	0.0	368.	11.00	418.	23.00	468.	35.00
19.	0.0	69.	12.35	119.	33.01	169.	0.0	219.	0.0	269.	0.0	319.	0.23	369.	10.10	419.	23.97	469.	35.84
20.	0.0	70.	15.28	120.	31.86	170.	0.0	220.	0.0	270.	0.0	320.	1.39	370.	10.74	420.	25.51	470.	37.99
21.	0.0	71.	14.27	121.	30.10	171.	0.0	221.	0.0	271.	0.0	321.	2.00	371.	10.42	421.	29.00	471.	38.00
22.	0.0	72.	12.59	122.	26.17	172.	0.0	222.	0.0	272.	0.0	322.	4.11	372.	11.00	422.	29.00	472.	37.69
23.	0.0	73.	12.25	123.	23.39	173.	0.0	223.	0.0	273.	0.0	323.	5.00	373.	12.46	423.	29.00	473.	38.41
24.	0.0	74.	9.28	124.	21.46	174.	0.51	224.	0.0	274.	0.0	324.	6.02	374.	14.77	424.	30.51	474.	39.37
25.	0.19	75.	8.00	125.	17.28	175.	0.33	225.	0.0	275.	0.0	325.	7.18	375.	14.09	425.	31.00	475.	39.00
26.	1.00	76.	8.00	126.	15.83	176.	0.0	226.	0.0	276.	0.0	326.	7.33	376.	16.20	426.	30.00	476.	39.00
27.	1.51	77.	8.38	127.	13.76	177.	0.0	227.	0.0	277.	0.0	327.	6.49	377.	17.00	427.	30.00	477.	38.10
28.	2.66	78.	9.53	128.	12.60	178.	0.0	228.	0.0	278.	0.0	328.	7.00	378.	17.00	428.	30.00	478.	39.00
29.	4.64	79.	10.69	129.	10.33	179.	0.0	229.	0.0	279.	0.0	329.	7.00	379.	17.00	429.	30.54	479.	39.41
30.	6.96	80.	11.00	130.	8.28	180.	0.0	230.	0.0	280.	0.0	330.	7.00	380.	17.00	430.	31.00	480.	40.57
31.	8.86	81.	9.00	131.	5.38	181.	0.0	231.	0.48	281.	0.0	331.	7.00	381.	15.02	431.	31.86	481.	41.73
32.	7.71	82.	9.00	132.	2.91	182.	0.0	232.	1.64	282.	0.0	332.	7.00	382.	15.71	432.	31.00	482.	42.00
33.	7.45	83.	9.32	133.	0.0	183.	0.0	233.	0.41	283.	0.0	333.	7.43	383.	14.60	433.	31.17	483.	41.92
34.	9.22	84.	10.00	134.	0.0	184.	0.0	234.	0.0	284.	0.0	334.	8.00	384.	14.92	434.	32.33	484.	40.00
35.	10.00	85.	9.36	135.	0.0	185.	0.0	235.	0.0	285.	0.0	335.	8.00	385.	15.38	435.	33.00	485.	40.00
36.	9.08	86.	9.00	136.	0.0	186.	0.0	236.	0.0	286.	0.0	336.	7.09	386.	15.78	436.	33.00	486.	39.49
37.	10.08	87.	9.95	137.	0.0	187.	0.0	237.	0.0	287.	0.0	337.	11.06	387.	16.00	437.	33.80	487.	37.66
38.	11.24	88.	14.33	138.	0.0	188.	0.0	238.	0.0	288.	0.0	338.	12.89	388.	16.00	438.	34.00	488.	37.00
39.	12.79	89.	17.53	139.	0.0	189.	0.0	239.	0.0	289.	0.0	339.	14.49	389.	16.25	439.	35.12	489.	36.01
40.	14.00	90.	19.42	140.	0.0	190.	0.0	240.	0.0	290.	0.0	340.	11.46	390.	17.41	440.	36.00	490.	34.86
41.	12.58	91.	20.00	141.	0.0	191.	0.0	241.	0.0	291.	0.0	341.	13.08	391.	18.56	441.	36.00	491.	33.70
42.	12.87	92.	20.74	142.	0.0	192.	0.0	242.	0.0	292.	0.0	342.	16.55	392.	19.00	442.	34.82	492.	32.54
43.	13.00	93.	21.00	143.	0.0	193.	0.0	243.	0.0	293.	0.0	343.	16.00	393.	19.88	443.	33.25	493.	29.54
44.	13.00	94.	21.11	144.	0.0	194.	0.0	244.	0.0	294.	0.0	344.	15.34	394.	21.00	444.	32.09	494.	26.46
45.	13.68	95.	23.84	145.	0.0	195.	0.0	245.	0.0	295.	0.0	345.	12.32	395.	21.00	445.	32.00	495.	22.28
46.	15.00	96.	27.00	146.	0.0	196.	0.0	246.	0.0	296.	0.0	346.	13.00	396.	21.00	446.	32.00	496.	19.91
47.	15.00	97.	27.00	147.	0.0	197.	0.13	247.	0.0	297.	0.0	347.	13.00	397.	20.49	447.	32.00	497.	18.76
48.	13.37	98.	29.05	148.	0.0	198.	0.71	248.	0.0	298.	0.0	348.	13.00	398.	20.00	448.	32.00	498.	17.60
49.	12.03	99.	32.52	149.	0.0	199.	0.0	249.	0.0	299.	0.0	349.	15.86	399.	19.18	449.	32.00	499.	16.44

RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)
550.	14.57	550.	12.73	600.	46.00	650.	50.47	700.	55.00	750.	56.00	800.	10.71	850.	13.00	900.	21.11	950.	0.0
551.	13.13	551.	14.78	601.	46.00	651.	51.00	701.	54.50	751.	55.63	801.	6.08	851.	13.68	901.	23.84	951.	0.0
552.	11.97	552.	16.05	602.	46.92	652.	51.00	702.	54.66	752.	55.00	802.	2.61	852.	15.00	902.	27.00	952.	0.0
553.	10.81	553.	17.41	603.	47.00	653.	51.00	703.	55.00	753.	55.00	803.	1.45	853.	15.00	903.	27.00	953.	0.0
554.	9.31	554.	19.72	604.	47.00	654.	51.00	704.	54.03	754.	55.00	804.	0.30	854.	13.37	904.	29.05	954.	0.0
555.	7.50	555.	21.52	605.	47.00	655.	51.00	705.	54.00	755.	55.00	805.	0.0	855.	12.03	905.	32.52	955.	0.0
556.	6.34	556.	23.35	606.	47.00	656.	51.42	706.	54.00	756.	55.00	806.	0.0	856.	12.26	906.	31.01	956.	0.0
557.	4.37	557.	24.83	607.	47.00	657.	52.00	707.	54.00	757.	55.00	807.	0.0	857.	14.29	907.	31.00	957.	0.0
558.	3.03	558.	25.99	608.	47.00	658.	52.00	708.	54.00	758.	55.00	808.	0.0	858.	14.56	908.	31.62	958.	0.0
559.	1.87	559.	27.15	609.	47.04	659.	52.00	709.	54.00	759.	55.00	809.	0.0	859.	15.20	909.	33.00	959.	0.0
560.	0.71	560.	28.31	610.	49.00	660.	52.00	710.	54.00	760.	54.22	810.	0.0	860.	16.76	910.	32.37	960.	0.0
561.	0.0	561.	29.46	611.	49.33	661.	52.20	711.	54.00	761.	54.00	811.	0.0	861.	17.00	911.	30.43	961.	0.0
562.	0.0	562.	30.62	612.	49.51	662.	53.00	712.	54.00	762.	54.00	812.	0.0	862.	17.00	912.	30.00	962.	0.0
563.	0.0	563.	31.78	613.	49.00	663.	53.00	713.	54.77	763.	54.00	813.	0.0	863.	17.23	913.	30.00	963.	0.0
564.	0.0	564.	32.94	614.	49.00	664.	53.00	714.	56.00	764.	54.00	814.	0.0	864.	18.77	914.	30.51	964.	0.0
565.	0.0	565.	34.18	615.	49.00	665.	53.00	715.	56.00	765.	54.00	815.	0.0	865.	20.54	915.	32.41	965.	0.0
566.	0.0	566.	34.25	616.	49.00	666.	53.00	716.	56.00	766.	54.00	816.	0.0	866.	19.60	916.	33.00	966.	0.0
567.	0.0	567.	37.41	617.	48.72	667.	53.00	717.	56.02	767.	54.00	817.	0.0	867.	18.14	917.	32.27	967.	0.0
568.	0.0	568.	38.56	618.	48.87	668.	53.00	718.	57.00	768.	54.00	818.	0.0	868.	17.98	918.	32.00	968.	0.0
569.	0.0	569.	39.72	619.	50.00	669.	53.00	719.	56.67	769.	54.00	819.	0.0	869.	17.00	919.	31.04	969.	0.0
570.	0.0	570.	40.00	620.	50.00	670.	52.38	720.	56.00	770.	54.00	820.	0.0	870.	16.34	920.	32.20	970.	0.0
571.	0.0	571.	40.00	621.	50.00	671.	52.00	721.	56.00	771.	54.00	821.	0.0	871.	15.00	921.	33.36	971.	0.0
572.	0.0	572.	40.00	622.	50.00	672.	52.93	722.	56.00	772.	54.00	822.	0.0	872.	15.00	922.	34.00	972.	0.0
573.	0.0	573.	40.00	623.	49.78	673.	52.91	723.	56.00	773.	54.00	823.	0.0	873.	15.00	923.	34.00	973.	0.0
574.	0.0	574.	40.00	624.	49.00	674.	52.25	724.	56.00	774.	53.01	824.	0.0	874.	15.96	924.	34.00	974.	0.0
575.	0.0	575.	40.00	625.	49.00	675.	53.00	725.	56.00	775.	50.86	825.	0.0	875.	12.35	925.	33.01	975.	0.0
576.	0.0	576.	40.82	626.	49.69	676.	53.00	726.	56.00	776.	49.70	826.	0.0	876.	15.28	926.	31.86	976.	0.0
577.	0.0	577.	41.00	627.	50.00	677.	53.00	727.	56.00	777.	48.54	827.	0.0	877.	14.27	927.	30.10	977.	0.0
578.	0.0	578.	41.00	628.	50.00	678.	53.00	728.	56.00	778.	47.39	828.	0.0	878.	12.59	928.	28.17	978.	0.0
579.	0.0	579.	41.30	629.	50.00	679.	53.00	729.	56.91	779.	46.23	829.	0.0	879.	12.25	929.	23.39	979.	0.0
580.	0.0	580.	42.00	630.	49.68	680.	53.00	730.	57.00	780.	45.07	830.	0.0	880.	9.28	930.	21.46	980.	0.51
581.	0.0	581.	42.00	631.	49.00	681.	53.00	731.	57.00	781.	43.91	831.	0.19	881.	8.00	931.	17.28	981.	0.33
582.	0.0	582.	42.00	632.	49.00	682.	53.00	732.	57.00	782.	42.51	832.	1.00	882.	8.00	932.	15.83	982.	0.0
583.	0.0	583.	42.93	633.	48.20	683.	53.00	733.	57.00	783.	40.60	833.	1.51	883.	8.38	933.	13.76	983.	0.0
584.	0.0	584.	43.00	634.	48.00	684.	53.00	734.	57.00	784.	39.44	834.	2.66	884.	9.53	934.	12.60	984.	0.0
585.	0.0	585.	43.00	635.	48.00	685.	53.98	735.	57.85	785.	38.28	835.	4.64	885.	10.69	935.	10.33	985.	0.0
586.	0.0	586.	43.00	636.	48.27	686.	55.00	736.	58.00	786.	37.13	836.	6.96	886.	11.00	936.	8.28	986.	0.0
587.	0.0	587.	43.54	637.	49.00	687.	55.00	737.	58.00	787.	35.94	837.	8.86	887.	9.00	937.	5.38	987.	0.0
588.	0.0	588.	44.71	638.	49.58	688.	55.00	738.	58.00	788.	33.81	838.	7.71	888.	9.00	938.	2.91	988.	0.0
589.	0.0	589.	45.00	639.	50.00	689.	55.00	739.	58.00	789.	32.66	839.	7.45	889.	9.32	939.	0.0	989.	0.0
590.	0.0	590.	44.97	640.	50.00	690.	55.00	740.	58.00	790.	30.50	840.	9.22	890.	10.00	940.	0.0	990.	0.0
591.	0.0	591.	44.18	641.	50.00	691.	55.00	741.	58.00	791.	28.34	841.	10.00	891.	9.36	941.	0.0	991.	0.0
592.	0.0	592.	44.66	642.	50.00	692.	55.00	742.	58.00	792.	26.37	842.	9.08	892.	9.00	942.	0.0	992.	0.0
593.	0.0	593.	44.00	643.	50.00	693.	55.00	743.	58.00	793.	25.03	843.	10.08	893.	9.95	943.	0.0	993.	0.0
594.	2.36	594.	44.00	644.	50.00	694.	55.00	744.	58.00	794.	21.87	844.	11.24	894.	14.33	944.	0.0	994.	0.0
595.	3.94	595.	44.81	645.	50.00	695.	55.00	745.	57.15	795.	19.85	845.	12.79	895.	17.53	945.	0.0	995.	0.0
596.	5.31	596.	45.00	646.	50.00	696.	55.00	746.	56.00	796.	16.56	846.	14.00	896.	19.42	946.	0.0	996.	0.0
597.	8.26	597.	45.00	647.	50.00	697.	55.00	747.	56.00	797.	15.40	847.	12.58	897.	20.00	947.	0.0	997.	0.0
598.	9.42	598.	45.00	648.	50.00	698.	55.00	748.	56.00	798.	14.24	848.	12.87	898.	20.74	948.	0.0	998.	0.0
599.	11.15	599.	45.44	649.	50.00	699.	55.00	749.	56.00	799.	12.17	849.	13.00	899.	21.00	949.	0.0	999.	0.0

RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)	RECORD (SEC)	SPEED (MPH)
1000.	0.0	1050.	0.0																		
1001.	0.0	1051.	0.0																		
1002.	0.0	1052.	0.0																		
1003.	0.13	1053.	0.0																		
1004.	0.71	1054.	0.0																		
1005.	0.0	1055.	0.0																		
1006.	0.0	1056.	0.0																		
1007.	0.0	1057.	0.0																		
1008.	0.0	1058.	0.0																		
1009.	4.15	1059.	0.0																		
1010.	6.00	1060.	0.0																		
1011.	6.00																				
1012.	6.00																				
1013.	5.30																				
1014.	4.14																				
1015.	1.96																				
1016.	0.0																				
1017.	0.0																				
1018.	0.0																				
1019.	0.0																				
1020.	0.0																				
1021.	0.0																				
1022.	0.0																				
1023.	0.0																				
1024.	0.0																				
1025.	0.0																				
1026.	0.0																				
1027.	0.0																				
1028.	0.0																				
1029.	0.0																				
1030.	0.0																				
1031.	0.0																				
1032.	0.0																				
1033.	0.0																				
1034.	0.0																				
1035.	0.0																				
1036.	0.0																				
1037.	0.48																				
1038.	1.64																				
1039.	0.41																				
1040.	0.0																				
1041.	0.0																				
1042.	0.0																				
1043.	0.0																				
1044.	0.0																				
1045.	0.0																				
1046.	0.0																				
1047.	0.0																				
1048.	0.0																				
1049.	0.0																				

BILLING CODE 6560-01-C

BILLING CODE 6560-01-C

24. An Appendix XII to Part 86 is proposed and reads as follows:

Appendix XII.—Heavy Duty Vehicle (HDV) Evaporative Emission System Service Accumulation Procedure

Any vapor storage device which adsorbs HC vapors and subsequently releases them to the engine induction system during vehicle operation shall be subjected to a minimum of 100 load-purge cycles. One load-purge cycle shall be accomplished by conducting one of the following procedures:

(1) *Vehicle procedure:* Park a fully-warm vehicle (a vehicle that has been driven for at least 15 minutes) for a time period of at least 3 hours. Then drive the vehicle through at least one cycle of the HDV reference (transient) urban dynamometer driving schedule.

(2) *Laboratory procedure:* Flow gasoline vapors into a pre-purged vapor storage device until at least 10 percent of the input HC mass flow rate is passing through the device. Purge the device with a volume of air which is at least as great as, and which has a temperature no higher than that which would be drawn through the device if it were installed on the test vehicle and the vehicle was operated according to the HDV reference (transient) urban dynamometer driving schedule.

Ten load-purge cycles accumulated immediately prior to certification testing shall be conducted according to method (1) listed above. The preceding 90 cycles (minimum) shall be conducted according to either methods (1) or (2) above, or any combination of these methods.

A modified procedure may also be used, if approved in advance by the Administrator.

[FR Doc. 80-13142 Filed 4-29-80; 8:45 am]

BILLING CODE 6560-01-M